

DEPARTMENT OF THE ARMY SUPPLY BULLETIN

Army Medical Department Supply Information

Headquarters, Department of the Army, Washington, DC 20310-2300 20 February 2007

Effective until rescinded or superseded

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Table of Contents	Page
Errata Sheet -	ES-1
SECTION I - Materiel Equipment Information	1-1
APPENDIX A - Operator & Maintenance Literature for Medical Equipment, Disc 1	A-1
APPENDIX B - Operator & Maintenance Literature for Medical Equipment, Disc 2	B-1
APPENDIX C - Operator & Maintenance Literature for Medical Equipment, Disc 3	C-1
APPENDIX D - Operator & Maintenance Literature for Medical Equipment, Disc 4	D-1
APPENDIX E - Operator & Maintenance Literature for Medical Equipment, Disc 5	E-1
APPENDIX F - Operator & Maintenance Literature for Medical Equipment, Disc 6	F-1
APPENDIX G - Operator & Maintenance Literature for Medical Equipment, Disc 7	G-1
APPENDIX H - Refrigerator, Blood, 4110-01-506-0895, PMCS Procedures	H-1
APPENDIX I - Invasive Monitoring Instructions	I-1
APPENDIX J - External O ₂ Regulator Verification	J-1
APPENDIX K - External N ₂ O Regulator Verification	K-1
APPENDIX L - Use of HEPA Filter With IMPACT 754M Ventilator	L-1
INDEX -	IN-1

NOTICE

This Supply Bulletin is devoted entirely to Materiel Equipment Information

Errata Sheet For SB 8-75-SB-11 dated 20 November 2006

Any inadvertently omitted chapters, paragraphs, sentences, et. al, are incorporated in this Supply Bulletin following this Errata Sheet and before Section 1 of this SB 8-75-S2.

Title/Cover Page

After Chapter 11 line and before Appendix A line, ADD:

CHAPTER 12 - PATIENT MOVEMENT ITEMS (PMI)

Chap. 3

P. 3-8, para 3-37 (after para 3-16) is incorrectly numbered. It should read para 3-17.

P. 3-9 (new para 3-17), para 3-17, e, (3) and (4) are missing (insert).

(3) Order more frequently for smaller quantities.

(4) Do not permit the logistics IS to automatically reorder temporary out of stock or backordered items on a daily basis, if the item cannot be filled by the PV in a reasonable period of time. Such continuous reordering does nothing to obtain the item and increases the number of unfilled/cancelled requisitions, thereby lowering the fill rate.

P. 3-53, para 3-69 f. is incorrectly numbered. Change f to d; it should be para. **3-69 d.** The MTF commanders may exempt any specific instrument from MIREP for a valid reason. A record of exempt items and the reason for exemption will be maintained on file.

P. 3-53, para labeled X-X3 including a. and b. should be para

e. Medical instrument recycling equipment program contracts

Recycling services will be obtained through local purchase procedures. Contracts will provide for:

(1) An itemized receipt for instruments turned over to a contractor for recycling.

(2) An itemized statement of recycling cost.

Chap 9

P 9-8, top of page – information is duplicated down to paragraph b. Delete everything down to b. Top of page should begin with para b. Cold Chain Management.

Chap 12

Chapter 12 was omitted in SB 8-75-11. It is included in its entirety after this Errata Sheet.

CUMULATIVE INDEX FOR 2006

Replace the 2006 Cumulative Index in SB 8-75-11 with the corrected one after Chapter 12 of this Errata Sheet.

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This Supply Bulletin contains procedural guidance to augment the policies published in the revised AR 40-61, *Medical Logistics Policies and Procedures*.

Table of Contents	Page
Errata Sheet -	i
Overview -	ii
CHAPTER 1 - Introduction	1-1
CHAPTER 2 - Medical Logistics Systems	2-1
CHAPTER 3 - Medical Materiel Management	3-1
CHAPTER 4 - Quality Control Information	4-1
CHAPTER 5 - Medical Equipment Management	5-1
CHAPTER 6 - Medical Equipment Maintenance	6-1
CHAPTER 7 - Environmental Services Management In Healthcare Organizations	7-1
CHAPTER 8 - Facility Life-Cycle Management	8-1
CHAPTER 9 - Medical Materiel Readiness	9-1
CHAPTER 10 - Procedures for Management of Medical Assemblages	10-1
CHAPTER 11 - Optical Fabrication	11-1
CHAPTER 12 - DOD Patient Movement Items (PMI)	12-1
Appendix A - Similar Asset/Estimated FMV Worksheet	A-1
Appendix B - Instructions for Recording DIN-PACS Medical Systems on Activity Property Books for Sites Using DMLSS	B-1
Appendix C - Draft Copy of <i>TB MED 750-1</i>	C-1
GLOSSARY -	GL-1
CUMULATIVE INDEX FOR 2006 - CORRECTED -	IN-1

NOTICE

This is the last issue of the DA SB 8-75 Series to be published for 2006

CHAPTER 12. DOD PATIENT MOVEMENT ITEMS (PMI)

12-1. PATIENT MOVEMENT ITEMS (PMI) EQUIPMENT

a. **DEFINITION:** PMI is the specific medical equipment and durable supplies that must be available to support patient transport. The PMI program consists of designated medical equipment assets (including the consumable supplies needed for their proper use) and associated durable supplies necessary for patient transport. The DOD PMI Program inventory is contained in the allowance standard (AS) 887P series. Examples of standardized PMI include: Zoll Defibrillators, Ventilator Impact 754M, Controller Ivac Alaris MedSystem III, Suction Impact 326M, Monitor Propaq 206EL, Pulse Oximeter BCI 3303 and Oxygen Analyzer MiniOX 3000. The mission of the PMI system is to support patients' in-transit, to exchange in-kind PMI without degrading medical capabilities, and to provide prompt recycling of PMI. It is the originating Medical Treatment Facility's (MTFs) responsibility to provide the PMI required to support the patient during movement. PMI accompanies a patient throughout the chain of movement, from the originating MTF to the destination MTF, whether it is an intra-theater or inter-theater transfer. Planners must ensure that PMI is available at the correct location and ready for use.

b. **AIR-WORTHINESS RELEASE (AWR):** AWR has been approved for the standardized PMI used during evacuation of patients on military aircraft. Requests to add items to the AWR list should be sent to the Commandant, AMEDDC&S, ATTN: HSMC-FC, Fort Sam Houston, TX 78234 IAW AR 40-61, section 3-22, paragraph 6d. and coordinated with HQ AMC/SGXL to include fixed wing air worthiness approval.

c. **PATIENT MOVEMENT ITEM TRACKING SYSTEM (PMITS):** PMITS is a software system used to keep track of moveable medical assets such as PMI. It was developed by a commercial vendor and managed by the Program Management Office Defense Medical Logistics Standard System (DMLSS). PMITS keeps track of equipment by collecting scans and sharing the information with other PMITS users; thereby making the data available to those managing re-supply. The software is installed on a laptop computer and uses a barcode scanner to load the label readings into a network providing the PMI type, model and serial number of the asset. The PMITS laptop maintains the database that is refreshed every twenty-four hours. The PMITS database contains information to identify ownership, and the movement history of all scanned and tracked items. There are special printers at the PMI Centers available to create bar code labels to place on equipment. Not all units or MTFs will have a PMITS system. Those who do not have PMITS, will need to track the PMI manually, as described in para. 12.2.

12-2. PROCEDURES FOR PROCESSING PMI

a. **THEATER UNITS**
Combatant Commander. Intra-theater movement of PMI is the responsibility of the theater commander. Theater policy for PMI will be established and distributed to the applicable units, as required.

b. CONUS MTFs

(1) As patients are evacuated back to MTFs closer to home station, their care is the first priority. Once they are stabilized and transitioned to a ward at the MTF, the PMI is no longer needed for those patients. The PMI will be recycled, and returned to medical logistics and in turn to the nearest PMI Center.

(2) The three divisions within the MTF that coordinate the patient's movement with PMI are; Patient Administrative Division (PAD), the Emergency Division (ED) and the Logistics Division (LOG).

(a) The Chief of PAD will ensure that the timely notification of all inbound and outbound patients is provided to ED and LOG. PAD will also provide them a copy of the Patient Movement Request (PMR).

(b) The Chief of ED will manage the patients and the PMI that accompanies them. Once the PMI is no longer needed for the patients, PAD will notify LOG that the PMI is available for pick up.

(c) The Chief of LOG will ensure that PMI is picked up, as required, from ED and delivered to the nearest PMI Center location. Managing PMI assets includes tracking each item by using manual transfer documents or scanning the items using PMITS where available.

(3) The TMO can assist in determining which AFB is closest. TAC (F144) is authorized to fund military air. TAC (A1LD) is authorized to fund routine ground transportation. PMI Center Shipping Locations are;

- (a) 89th Medical Group/SGSL PMI Center
ATTN: SSgt Matthew Bacanskas
3244 Tennessee Ave
Andrews Air Force Base, MD 20762, MD 20762-5184
DSN 857-7956
- (b) 375th Medical Group/SGSL PMI Center
ATTN: Ms. Iva Merritt/ Mr. Darryl Moore
120 South Adams Street, Bldg 4020
Scott AFB, IL 62225-5300
DSN 576-1173
- (c) 60th Medical Support Squadron/SGSL PMI Center
PMI Center
ATTN: SSgt Ramirez
101 Bodin Circle, Bldg 795
Travis AFB, CA 94535-1800
DSN 796-3755

- (d) 435th Medical Group/SGSL PMI Center
PMI Center Ramstein
ATTN: TSgt Michael Scott
Unit 3215
APO AE 09094-3215
DSN 314-479-2437
- (e) Air Force Medical Support Agency (AFMSA/SGSLW)
Mark For: Patient Movement Items (PMI)
ATTN: Mr. Steve Messer / Mr. Stephen Winn
601 Davy Crockett Drive, Bldg 1534
Kelly USA, TX 78226-1885
DSN 945-6061
- (f) 374th Medical Support Squadron/SGSL, PMI Center
Yokota Air Base JA
ATTN: SSgt Joey Aroc / SrA Thomas Elliott
Building 4145, Unit 5225
APO AP 96328-5225
DSN 315-225-4932)

12-3. REFERENCES

For additional information refer to the below listed documents or contact ACSLOG representatives at 210 221 6044/6435.

- a. *Army Regulation 40-61, Chapter 5*, Medical Logistics Policies and Procedures, dated 25 January 1995.
- b. *Air Force Instruction (AFI) 41-209, Chapter 8*, Patient Movement Items (PMI) dated 10 March 2004
- c. *Joint Pub 4-02*, Doctrine for Health Service Support in Joint Operations dated 30 July 2001.
- d. *Joint Pub 4-02.1*, Joint Tactics, Techniques, and Procedures for Health Service Logistics Support in Joint Operations dated 6 October 1997.
- e. *Joint Pub 4-02.2*, Joint Tactics, Techniques and Procedures for Patient Movement in Joint Operations dated 30 December 1996.
- f. *FM 4-02.1*, Combat Health Logistics, Appendix F-Patient Movement Items dated 28 September 2001.

12-4. BAR CODING METHODOLOGY AND CODES

PMI will be identified and tracked using a bar code system. The item identification code has 14 positions to identify the type of item and model.
(10 Aug 06, check for latest version at: <https://private.amc.af.mil/sg/sgsl/sgslpmi>)

a. Positions 1-3 are alpha characters and identify the type of equipment item.

ITEM CODES

DEF - defibrillator	STR - Stryker frame
IVC - IV controller	SXN - suction apparatus
MON - vital signs monitor	OAN - oxygen analyzer
POX - pulse oximeter	VEN - ventilator
PCA - pain pump (ambIT) ****	

**** The PCA pain pump is not an approved PMI, but is officially tracked by the PMITS. The PCA pain pump is reusable and should be returned to theater via the AF transportation system like all PMI. No exceptions.

b. The fourth position for each equipment item will have an alpha character to specify the manufacturer and model. This means that each type of equipment (i.e. DEF or VEN) can have up to 26 combinations of manufacturer and models in the PMI program. For example, an oxygen analyzer manufactured by MSA such as Miniox 3000 would be "OANA", while the same manufacturer's older model, the Miniox III that is still in use, would be an "OANB." The fourth position would be a separate table of manufacturers and models for each equipment type. The codes for an OAN would not be the same for an MON or VEN. HQ AMC/SGXL will establish and maintain the list and ensure coordination with the PMI Centers.

c. Positions 5-14 characters (numbers or letters) of the item's serial number (self explanatory). One key issue for the PMI Centers and Office of the Surgeon General, South c/o MCLO-P, and HQ AMC/SGXL is the barcode must contain all fourteen spaces. If while creating a barcode you have not filled in all fourteen spaces add Zeroes right after the fourth position so all fourteen spaces are completely filled.. Some older bar codes may exist using the five digit index number (ECN). Those will continue to work and will eventually be changed. The PMI center will identify a user location code in the database of PMITS representing the property book owner.

d. Of the 15 items formally in the PMI program, seven will be tracked as "groups" and will be counted as lot quantities versus by serial number. These items (litters, blankets, etc.) will use a 14 position combination of alpha characters and spaces. Changes or additions will be coordinated through ACSLOG and allow for variations or items unique to a particular Service or PMI Center.

LITTER_NATO or LITTER_OTHER	LITTER STRAPS
LITTER_PADS	I_V_POLES
RESTRAINT SET	SPINAL_BOARD
BLANKET_Wool / Cotton	

12-5. REQUESTING BARCODE LABELS

a. The protocol for requesting bar code labels is a controlled process to maintain integrity of the PMI data base. The PMITS label must be ordered from a PMI Center or Office of the Surgeon General, South/c/o MCLO-P, or HQAMC/SGXL. This is at no cost to the unit. The requesting location must complete a Bar Code Request Form before any barcode labels will be printed and sent to the requestor.

The PMI Center will refer to the Ownership / Location Table or Office of the Surgeon General, South c/o MCLO-P for unique Army locations.

b. You don't need to have a PMITS system to label your PMI. The primary reason to put labels on MTOE PMI-like items, is in case float PMI is not available and the unit has to use property book assets to send with an evacuated patient. The PMI Center will mail the labels to the unit for application. However, prior to printing or requesting labels, the unit shall contact this office for ownership assignment in the PMITS database.



Figure 1: Bar Code Example

DSN: 779-6952

Phone: _____

Phone:

Equipment Model:	Identifies the equipment so that we can choose the correct 4 letter id for the barcode (example: Lifepak 10-59)
PMITS Code:	The 4 letter id that we will use in the barcode, this field is not required (example: DEFA)
Index #:	The number assigned by MERC, this is used as the last numbers of the barcode (example: 2056)
Serial #:	The number assigned by the manufacturer of the equipment, this will be entered into the database (example: 00033676)
Project or Ownership #:	Project: the category the equipment belongs to (Unit Asset, WRM - MASF, WRM - AELT, WRM - AE Kits, etc.) we will assign the corresponding number and make it part of the barcode (example: Unit Asset)
	<u>Ownership #</u> : if corresponding ownership # is already known, it can be used instead of the project (example: 047) it will be entered into the PMITS data base
Recert Due Date:	The date when maintenance is due, assigned by MERC (if there is no recertification date, put "None") (example: 2003/03/31)

[illegible]

12-6

2006 CUMULATIVE INDEX FOR THE SB 8-75 SERIES

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
A		
A2S - AMEDD Small Shelter -----	S4 -----	8-1
AAC - Acquisition Advice Code -----	S4 -----	6-1
AAC "W" and "J" Relationships-----	S5 -----	12-1
Abaxis Clinical Chemistry Analyzer, Model Piccolo, NSN 6630-01-415-1593 -----	S2 -----	1-1
Acceptance Testing -----	S5 -----	10-6
Accounting for Pharmaceutical (ARNG) -----	S10 -----	4-7
Acquisition Advice Code (AAC) 'W' and 'J' Relationships -----	S1 -----	4-1
Acquisition Advice Codes and Unit Funded Requisitions-----	S7 -----	5-10
Activity/RMC/MSD Commander Review and Approval -----	MEDCASE -----	4-2
Additional Information for Contacting USAMMA ----- (at the end of each chapter) -----	S7	
Additional Product Information – CBRN and MCDM -----	S7 -----	5-4
Administrative and Information Management Introduction -----	MEDCASE -----	13-1
Alaris Infusion Pump, Model 2863B, NSN 6515-01-452-0625 -----	S2 -----	1-1
Alaris Infusion Pump, Model MEDSYSTEM III, NSN 6515-01-452-0625-----	S2 -----	1-2
Alaris Infusion Pump Service Bulletins -----	S2 -----	1-2
Alternate Acquisition Activity Introduction -----	MEDCASE -----	8-1
AMEDD Fielding Policy-----	S4 -----	1-1
AMEDD Maintenance Sustainment Program -----	S10 -- Appendix B	
Analyzer, Gas, Anesthetic, 6630-01-487-6987 -----	S6 -----	3-1
Anesthesia Apparatus, 6515-01-457-1840-----	S6 -----	2-1
Annual General Inspection (AGI) – Medical Logistics -----	S10 -----	6-1
APPMO Responsibilities-----	S5 -----	10-1
Approval of MEDCASE/SuperCEEP Requirements Introduction -----	MEDCASE -----	4-1
APS and SC VIII APS Locations -----	S7 -----	3-1
APS Program Background -----	S7 -----	3-1
APS Storage Sites -----	S7 -----	8-2
AR ACEL – Army Reserve Acceleration Program -----	S4 -----	4-2
Army National Guard Policy on the Management of Pharmaceuticals in Medical Elements -----	S10 -----	4-1
Army National Guard (ARNG) Supplement to <i>AR 40-61, Medical Logistics Policies and Procedures</i> -----	S10 -----	3-1
ARNG Class VIII Materiel Management Course -----	S10 -----	1-4
ARNG Federal Supply Class 6505 Materiel -----	S10 -----	4-1
ARNG Requisitioning Instructions-----	S10 -----	5-1
ARNG Sources of Medical Logistics Assistance (<i>AR 40-61</i>) -----	S10 -----	1-1
ARNG Medical Equipment Maintenance Policy and Procedures (<i>ARs 40-61, 750-1</i>) ---	S10 -----	3-1
ARNG Unit Inspection Checklists: -----	S10 -----	6-1
Pharmaceuticals and Injection Devices -----	S10 -----	6-3
Management of Medical Assemblages-----	S10 -----	6-7
Medical Equipment Maintenance -----	S10 -----	6-9
ARN Units Assigned a Patient-Care Mission -----	S10 -----	4-1
Army Medical Logistics (MEDLOG) Overview-----	S1 -----	2-1
Army National Guard (ARNG) Responsibilities -----	S10 -----	All
Army Prepositioned Stock (APS) Program -----	S7 -----	3-1
Army Prepositioned Stock (APS) and Unit Deployment Package (UPD) Automated Systems-----	S7 -----	8-1

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Army Transformation/Medical Logistics Support "Army At War"/AMEDD Modularity/ PPBE/Army Reserve Force Generation	S1	2-1
Army War Reserve Deployment System (AWRDS)	S7	8-1
Arthroscopic System, 6515-01-431-9631	S6	2-1
Asset Visibility	S7	8-2
Assignment of a BLIC	MEDCASE	3-4
Assignment of a MEDCASE/SuperCEEP ACN	MEDCASE	3-3
Authorized Recipients of Controlled Substances DODAAC Requisitioners (Table 4-1)---	S1	4-3
Auto Sequences, Fluke Biomedical/DNI Test Equipment	S6	3-1
Available Operator and Maintenance Literature.....	S2	1-2
Availability of the USAMMA CD-ROM	S1	1-3
Award and Acceptance	MEDCASE	12-4

B

Background – APS and UPD.....	S7	8-1
Background on DOD/FDA Shelf Life Extension Program (SLEP)	S7	9-1
Bar Coding Methodology and Codes	11	12-3
Base Level Commercial Equipment (BCE)	MEDCASE	13-5
Basic Procedures for Local Purchase.....	MEDCASE	7-4
Basic Requisitioning Procedures	MEDCASE	6-1
Battery Support System, 6625-01-192-9460.....	S6	2-1
Belmont Blood Fluid Warmer, Model FMS 2000, NSN 6515-01-479-4269	S2	1-2
Book Set Components Listing in NSN Order	S9 -- Appendix B	
Business Process Improvements for Military Radiology	S5	4-2

C

Calibrator – Analyzer (VT-Plus), 6515-01-491-6615	S6	3-1
CD ROM, Availability of the USAMMA CD.....	S1	1-3
Centralized Class VIII Repair Parts Program	S10 -- Appendix C	
Centrally Managed Program – Supply Class VIII	S1	3-1
Centrally Managed Systems	MEDCASE	13-4
Central Requirements	MEDCASE	3-12
CICA.....	MEDCASE	14-2
Class VIII Contingency Materiel Programs - Introduction	S7	1-1
Clinical Approach and Business Process Reengineering	S5	5-6
Combat Support Equipment Assessment (CSEA)	S1	3-1
Commanders' Review Program for Durable Medical Materiel (AR 40-61)	S10	1-4
Communication/Automation Data Processing Equipment Acquisition	MEDCASE	13-3
Competition in Contracting Requirements Introduction	MEDCASE	14-1
Computed Radiography, 6525-01-504-5002.....	S6	2-1
Concentrator, Oxygen, 6515-01-434-4629	S6	2-2
Consumable/Support Items for Medical Equipment Unique to a Set are Identified in Section IV in the Published UA Listings	S5	11-6
Consumables Handbook	S4	7-1
Container Inspection	S4	13-1
Content and Numbering System for the SB 8-75 Series	S1	1-2
Controlled Substance Authorized Recipients Listings (Table 4-1)	S1	4-3

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Controlled Substances – NSNs-----	S5 -----	12-1
CSC Inspections -----	S4 -----	12-1
Cumulative SB 8-75 Series Index for 2006 -----	11 -----	IN-1

D

DA SB 8-75 Series Overview -----	S1 -----	1-1
Damage Inspection After Movement -----	S4 -----	13-1
Defense Medical Logistics Standard Support (DMLSS) System -----	S7 -----	8-3
Defense Logistics Agency (DLA) Customer Support Assistance Representatives -----	S1 -----	4-1
Defense Reutilization Management Office (DRMO) -----	S6 -----	1-4
Defibrillator, Monitor Recorder, 6516-01-515-4197 -----	S6 -----	2-3
Dental Operating Unit, Field, 6520-01-493-3759 (AKA "DEFTOS") -----	S6 -----	2-3
DEPMEDS DISE/PDISE Systems -----	S4 -----	15-3
Deputy Commander for Operations (MCMR-MMO) -----	S1 -----	2-6
Deputy Commander for Support (MCMR-MMA) -----	S1 -----	2-9
Derivative DODACC and UIC -----	S4 -----	3-1
Destruction of Defective or Expired Materiel Quality Control Information -----	S10 -----	4-9
Destruction of MCDM -----	S7 -----	5-9
Development of MEDCASE/SuperCEEP Requirements Introduction -----	MEDCASE -----	3-1
Deviations -----	MEDCASE -----	1-3
DH1 Project – Deployable Force Package (DFP) -----	S7 -----	5-1
DHS Project – Initial Potency & Dated (P&D) MCDM for the Medical Equipment Set, Chemical Agent Patient Treatment (LIN M23673) -----	S7 -----	5-5
Diagnostic Imaging and Radiation Therapy Requirements -----	MEDCASE -----	12-1
Diagnostic Imaging and Radiation Therapy Requirements Introduction -----	MEDCASE -----	12-1
Diagnostic Imaging and Radiation Therapy Requirements Scope -----	MEDCASE -----	12-1
Digital Imaging and the Digital Imaging Communication in Medicine Standard Introduction -----	S5 -----	8-1
Digital Technology -----	S5 -----	4-3
DISE – Distribution Illumination Systems Electrical -----	S4 -----	15-1
Disposition of Replaced TEMPER -----	S4 -----	8-3
DMLSS System -----	MEDCASE -----	3-6
DOD/FDA Shelf Life Extension Program (SLEP) -----	S7 -----	9-1
Dolly Set, M-1022A1 Current Status -----	S4 -----	14-1
Draft Copy of <i>TB MED 750-1</i> -----	11 -----	C-1
Drug Enforcement Administration (DEA) Biennial Controlled Substance Inventory -----	S1 -----	4-2

E

Electrosurgical Apparatus, 6515-01-309-6647 -----	S6 -----	2-4
Environmental Services Management In Healthcare Organizations -----	11 -----	7-1
Equipment Contracting for the Laboratory -----	S5 -----	7-1
Equipment Replacement -----	MEDCASE -----	2-5
Equipment Replacement Report -----	MEDCASE -----	16-1
Equipment Replacement Reports General -----	MEDCASE -----	16-1
Equipment Replacement Reports Introduction -----	MEDCASE -----	16-1
Emergency Operations Center (EOC), The Medical Logistics Support Team (MLST), and The USAMMA Forward Logistics Support Element (USAMMA FWD) -----	S7 -----	7-1

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Equipment Acquisition in TDA Medical Activities Quality Control Information -----	S10 -----	5-2
Equipment Acquisition in Medical TOE Units Quality Control Information -----	S10 -----	5-1
Errata Sheet for SB 8-75-S7 -----	11 -----	i
Establishment of Required Medical Equipment Maintenance Records -----	S10 -----	3-7
Excess Medical Materiel -----	S1 -----	4-4
Excess Medical Materiel -----	S4 -----	2-1
Execution and Acquisition Source -----	MEDCASE -----	12-2
Execution of BLIC "MB" Requirements -----	MEDCASE -----	5-2
Execution of MEDCASE/SuperCEEP Requirements Introduction -----	MEDCASE -----	5-1
Expiration of Unfunded MEDCASE/SuperCEEP Requirements -----	MEDCASE -----	4-3
External N ₂ O Regulator Verification -----	S6 -----	H-1
External O ₂ Regulator Verification -----	S6 -----	G-1
External Standard Operating Procedures, Medical Maintenance Operations Division Hill AFB, UT -----	S6 -----	A-1
External Standard Operating Procedures, Medical Maintenance Operations Division Tobyhanna, PA -----	S6 -----	B-1
External Standard Operating Procedures, Medical Maintenance Operations Division Tracy, CA -----	S6 -----	C-1
Extended Installation -----	MEDCASE -----	12-3

F

Facility Life-Cycle Management -----	11 -----	8-1
FDA/DOD Shelf Life Extension Program Testing Criteria -----	S7 -----	9-1
Federal Supply Class (FSC) 6505 Materiel for ARNG -----	S10 -----	4-1
FED LOG on CD -----	S5 -----	12-2
Financial Management -----	MEDCASE -----	2-6
Fleet Management System (FLMS) -----	S7 -----	8-3
Force Projection Directorate (MCMR-MMO-P) -----	S1 -----	2-7
Force Sustainment Directorate (MCMR-MMO-S) -----	S1 -----	2-8
Foreword For SB 8-75-S7 -----	S7 -----	i
Formularies for ARNG -----	S10 -----	4-2
Examples of Formularies -----	S10 -----	4-4
Funding MEDCASE/SuperCEEP Requirements -----	MEDCASE -----	5-1
Funds and Funding Policy for Site Preparation -----	S5 -----	3-2
Funds Management at the Station -----	MEDCASE -----	5-2

G

General Information -----	S5 -----	1-1
General Information (RCHD) -----	S7 -----	6-2
General Medical Materiel Information -----	S1 -----	4-1
Generator, Oxygen, Medical, POGS, 6530-01-533-4481 -----	S6 -----	2-4
Glossary for:		
SB 8-75-MEDCASE -----	MEDCASE -----	GL-1
SB 8-75-S1 -----	S1 -----	GL-1
SB 8-75-S3 -----	S3 -----	GL-1
SB 8-75-S4 -----	S4 -----	GL-1
SB 8-75-S5 -----	S5 -----	GL-1

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
(continued) - Glossary for:		
SB 8-75-S7 -----	S7 -----	GL-1
SB 8-75-11 -----	11 -----	GL-1
Goals of Digital Radiology -----	S5 -----	4-2
Goals of Military Radiology -----	S5 -----	4-1
Ground Rod Set -----	S4 -----	9-2
H		
Hand Receipts -----	S4 -----	3-2
HOSP – Hospital Optimization Standardization Program -----	S4 -----	4-1
How To Request the <i>SB 8-75 Series</i> and <i>SB 8-75-S10</i> -----	S10 -----	1-4
I		
Identification of Key Elements to be Monitored -----	S5 -----	9-4
Identification of Medical Equipment Maintenance Resources -----	S10 -----	3-1
Identification of Medical Equipment Requiring Periodic Maintenance and an Equipment Maintenance Log -----	S10 -----	3-3
Equipment Maintenance Log Printing Protocol (for PMI) -----	S10 -----	3-3
Identification of Requirements -----	MEDCASE -----	3-2
Information Assurance -----	S5 -----	10-10
Information Mission Area (IMA) Software and Hardware -----	MEDCASE -----	13-2
Information Regarding the SB 8-75 Series -----	S1 -----	1-1
Initial Issue Medical, Chemical, Biological, Radiological, and Nuclear Defense Materiel (MCDM) -----	S7 -----	5-1
Initiation of BLIC “NF” and BLIC “MB” Requirements -----	MEDCASE -----	3-11
Inscribing Equipment -----	S6 -----	1-3
Installation During Site Preparation -----	S5 -----	3-3
Instructions for Obtaining Supply Catalogs and Supply Bulletins -----	S5 -----	11-2
Instructions for Recording DIN-PACS Medical Systems on Activity Property Books for Sites Using DMLSS -----	11 -----	B-1
Integrated Logistics Support -----	S1 -----	3-2
International Logistics Office (ILO) and Foreign Military Sales (FMS) -----	S7 -----	10-1
Introduction to Processing of Urgent and Emergency MEDCASE/SuperCEEP Requirements -----	MEDCASE -----	9-1
Introduction to SB 8-75-11 -----	11 -----	1-1
Introduction to SB 8-75-S9 -----	S9 -----	i-1
Invasive Monitoring of mA for the Philips BV 300 C-Arm -----	S2 -----	1-3
Inspection and Checklist for Pharmaceuticals and Injection Devices -----	S10 -----	6-3
Inspection and Checklist for Management of Medical Assemblages -----	S10 -----	6-7
Inspection and Checklist for Medical Equipment Maintenance -----	S10 -----	6-9
ISO Door Locking Device -----	S4 -----	11-1
ISO Scissor Jacks -----	S4 -----	10-1
ISO Toolbox Inventory -----	S4 -----	9-1

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
J		
Justification for Other-Than-Full-and-Open Competition -----	MEDCASE -----	14-3
Justification of Requirements -----	MEDCASE -----	3-5
L		
Labeling Requirements and Guidance -----	S7 -----	9-4
Laboratory Automation -----	S5 -----	7-3
Leased Equipment -----	MEDCASE -----	5-4
Lifepak 10 Defibrillator/Monitor, NSN 6515-01-453-4003 -----	S2 -----	1-3
Light, Field Surgical, 6530-01-343-2033 -----	S6 -----	2-5
LOA Management -----	MEDCASE -----	7-2
Loan or Lease of Medical Materiel -----	S1 -----	4-5
Local Area Network (LAN) and Wide Area Network (WAN) -----	MEDCASE -----	13-3
Local Purchase and Letters of Authority (LOA) Introduction -----	MEDCASE -----	7-1
LOGCAT Codes -----	MEDCASE -----	11-2
Logistics Assistance Program -----	S4 -----	5-1
Logistics Assistance Program (LAP) -----	S1 -----	3-3
Logistics Support Elements -----	S5 -----	6-1
M		
Maintenance Allocation Chart (MAC) -----	S8 -----	1-4
Maintenance Divisions' Addresses -----	S6 -----	1-2
Maintenance Operations Division (MOD) Chief Personnel -----	S6 -----	1-1
Major Medical Assemblages/SC Number Cross Reference Listing -----	S5 -----	11-2
Management and Accountability of Initial Issue DFP MCDM -----	S7 -----	5-3
Management and Accountability for Initial Issue Potency & Dated (P&D) MCDM for the Medical Equipment Set, Chemical Agent Patient Treatment (LIN M23673) -----	S7 -----	5-6
Management of Requisitions -----	MEDCASE -----	6-5
Managing Technology in the Military Laboratory Introduction -----	S5 -----	7-1
Materiel Acquisition Directorate (MCMR-MMO-A) -----	S1 -----	2-6
Materiel Acquisition Directorate Realignment -----	S5 -----	1-2
MEDCASE and SuperCEEP General Information Introduction -----	MEDCASE -----	1-1
MEDCASE and SuperCEEP General Information Responsibilities -----	MEDCASE -----	1-1
MEDCASE Introduction -----	S5 -----	2-1
MEDCASE/SuperCEEP Action Codes -----	MEDCASE -----	4-3
MEDCASE/SuperCEEP Eligibility of Costs Other Than Unit Price -----	MEDCASE -----	15-2
MEDCASE/SuperCEEP Process -----	S5 -----	2-1
MEDCASE/SuperCEEP Program Eligibility -----	MEDCASE -----	2-1
MEDCASE/SuperCEEP Program Policies Introduction -----	MEDCASE -----	2-1
MEDCASE/SuperCEEP Programs -----	S5 -----	2-1
Medical Equipment/Instrument Illustrated Catalog on CD -----	S5 -----	11-2
Medical Book Sets for TOE Units in LIN Order -----	S9 -- Appendix A	
Medical Care Support Equipment (MEDCASE) Procedures (AR 40-61) -----	S10 -----	1-3
Medical Equipment Maintenance -----	11 -----	6-1

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Medical Equipment Management -----	11 -----	5-1
Medical Equipment Recommended for Conduct of ARNG Physical Examinations (AR 40-61) -----	S10 -----	2-1
Medical Equipment Service Literature Support -----	S6 -----	1-3
Medical Equipment Support -----	S6 -----	1-1
Medical Logistics Management Internship Program -----	S1 -----	3-3
Medical Logistics Support Team (MLST)-----	S1 -----	3-4
Medical Logistics Systems -----	11 -----	2-1
Medical Maintenance Operations In MTOE Units, <i>TB Med 750-2</i> -----	S6 -----	1-4
Medical MILCON Projects (BLIC "NF" and "MB" Requirements) Introduction-----	MEDCASE -----	11-1
Medical Maintenance -----	S10 -----	3-1
Medical Maintenance Operations Division Personnel -----	S2 -----	1-3
Medical Materiel Management -----	11 -----	3-1
Medical Materiel Quality Control (MMQC) and Medical Materiel Information (MMI) Messages -----	S1 -----	4-6
Medical Materiel Readiness -----	11 -----	9-1
Medical Services Information Logistics System (MEDSILS) -----	S5 -----	12-3
Medical Supply Support of the Army National Guard by USAMEDCOM Activities (AR 40-61) -----	S10 -----	1-2
Memorandum of Authorization For Medical Special Purpose Test, Measurement, and Diagnostic Equipment (TMDE) -----	S10 -- Appendix F	
Meter X-Ray Calibration, 6525-01-502-0504 -----	S6 -----	3-2
Methods of Describing MEDCASE/SuperCEEP Requirements-----	MEDCASE -----	14-2
MILCON Project Requirements Management (BLIC "NF" and "MB") -----	MEDCASE -----	3-9
Military Item Disposal Instructions (MIDI)/Military Environmental Information Source (MEIS)-----	S5 -----	12-3
Military Laboratory Benchmark Indicators -----	S5 -----	7-2
Military Radiology Functional Economic Analysis Introduction -----	S5 -----	4-1
MIPR Requests -----	MEDCASE -----	8-1
MLST Organizational Structure (Diagram) -----	S7 -----	7-3
Monitor the Effectiveness of Unit's Maintenance Program -----	S10 -----	3-9
Monitor, Vital Signs, NSNs 6515-01-423-5796, 6515-01-423-5872, 6515-01-432-2707, and 6515-01-432-2711 -----	S6 -----	2-5
Monitor, Vital Signs, INSERTV Feature of the Welch Allyn Propaq 206EL, NSNs 6515-01-432-2707 and 6515-01-432-2711 -----	S6 -----	2-6
Monitor, Vital Signs, 6515-01-432-2711 (Mainstream CO ₂ Sensor, Service and Replacement)-----	S6 -----	2-6
MRI Conversion Overview-----	S4 -----	4-1
MTF-Generated MEDCASE Program Requirement -----	S5 -----	2-3
MTF or RMC Initiation of Requirements -----	MEDCASE -----	3-2
Multimeter, Radiographic, PMX-III, 6525-01-387-0212-----	S6 -----	3-3

N

Noncompetitive Acquisition -----	MEDCASE -----	2-7
----------------------------------	---------------	-----

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
O		
Object is Improved Access to Radiology -----	S5 -----	8-3
Objectives for MEDCASE/SuperCEEP Program Submissions -----	MEDCASE -----	3-7
Obtaining the Consumables Handbook -----	S4 -----	7-2
On-Line Capability to Request NSN Assignment -----	S5 -----	11-3
Operating Table Components -----	S6 -----	K-1
Operator Level PMCS -----	S8 -----	1-1
Optical Fabrication -----	11 -----	11-1
Optical Microscope, 6650-00-973-6945 -----	S6 -----	2-7
Overview of a Medical MILCON Project -----	MEDCASE -----	11-1
Overview of Requisition Processing -----	MEDCASE -----	6-2
Overview of SB 8-75-11, AR 40-61 Revisions -----	11 -----	ii
Overview of the Local Procurement Process -----	MEDCASE -----	7-1
Overview of the MIPR Process -----	MEDCASE -----	8-1
Overview of SB 8-75-S5 -----	S5 -----	1-3
P		
PACS and Teleradiology Systems Introduction -----	S5 -----	10-1
Patient-Movement Items (PMI) Equipment -----	11 -----	12-1
PDISE – Power Distribution Illumination Systems Electrical -----	S4 -----	15-1
Physical Examination Stations – ARNG -----	S10 -----	2-1
Planning and Assessments -----	S5 -----	10-3
Policy Relative to Laboratory Equipment -----	S10 -----	2-3
Policy Relative to Radiology Equipment -----	S10 -----	2-3
Preventive Maintenance Checks and Services (PMCS) -----	S8 -----	1-1
Price Estimates -----	MEDCASE -----	15-1
Prime Vendor (PV) System -----	S10 -----	1-4
Printing Protocol (for PMI) -----	S11 -----	12-3
Printing Protocol Samples (for PMI) -----	S11 -----	12-3
Procedures for Authorizing and Equipment of ARNG Physical Examination Stations (AR 40-61) -----	S10 -----	2-1
Procedures for Management of Medical Assemblages -----	11 -----	10-1
Procedures for Processing PMI -----	11 -----	12-1
Processing of Urgent and Emergency MEDCASE/SuperCEEP Requirements		
Introduction -----	MEDCASE -----	9-1
Procurement Strategies -----	S7 -----	4-2
Program Composition for RCHD -----	S7 -----	6-1
Programming and Funding -----	S5 -----	10-2
Project Approval and Funding Procedures -----	S5 -----	3-4
Property Accountability -----	MEDCASE -----	2-6
Property Accountability and Maintenance Management of DIN-PACS -----	S5 -----	10-9
Provide for Qualified, Trained Medical Equipment Repairers -----	S10 -----	3-3
Providing Adequate Facilities Space and Time for Administrative and Medical Maintenance Functions -----	S10 -----	3-5
Pump, Infusion, 6515-01-486-4310 -----	S6 -----	2-8

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Pump, Infusion, 6515-01-452-0625 and 6515-01-486-4310 -----	S6 -----	2-7
Pump, Infusion, 6515-01-486-4310, Display Problems -----	S6 -----	1-1
Pump, Intravenous Infusion, 6515-01-498-2252 -----	S6 -----	2-9
Purpose and Applicability of SB 8-75-S5 -----	S5 -----	1-3
Purpose and Applicability of SB 8-75-MEDCASE -----	MEDCASE -----	1-1

Q

Quality Control Information -----	11 -----	4-1
Quality Control Messages -----	S10 -----	4-9

R

Radiology Performance Measures and Targets -----	S5 -----	4-3
Receipt Processing -----	MEDCASE ---	5-3, 6-5
Recommending Changes to the WebMRE System -----	MEDCASE -----	10-2
Recision of SB 8-75 Issues -----	S1 -----	1-2
Recommended Service Object Pairs from the DICOM Standard -----	S5 -----	8-2
Recommending Improvements and Reporting Errors for Medical Sets, Kits, and Outfits -----	S5 -----	11-4
References (for PMI) Printing Protocol (for PMI) -----	S11 -----	12-3
References and Resources -----	MEDCASE -----	11-3
Refrigerator, Blood, 4110-01-506-0895 -----	S6 -----	2-9
Refrigerator, Blood, 4110-01-506-0895 PMCS Procedures -----	S6 -----	J-1
Relabeling of MCDM -----	S7 -----	5-8
Release Authority (Deployments) -----	S7 -----	4-3
Release Authority (Humanitarian Relief Only) -----	S7 -----	4-3
Release Procedures for All Initial Issue MCDM -----	S7 -----	5-6
Repairer Level PMCS -----	S8 -----	1-3
Repair Parts Procedures Policy -----	S10 -----	3-9
Reserve Component Hospital Decrement (RCHRD) -----	S7 -----	6-1
Relocatable Buildings -----	MEDCASE -----	15-1
Repair Parts Procedures -----	S10 -----	3-8
Reporting Discrepancies -----	MEDCASE -----	15-5
Reports of Suspended or Destroyed Items -----	S1 -----	4-6
Required Service Object Pairs from the DICOM Standard -----	S5 -----	8-1
Required Technical Manuals and Manufacturers' Literature -----	S10 -----	3-6
Requirements Determination -----	S7 -----	2-1
Requirements for Operations and Equipment -----	S5 -----	5-6
Requesting Barcode Labels -----	11 -----	12-4
Reserve Component Medical Materiel Management Information -----	S1 -----	4-7
Responsibilities During the Project -----	MEDCASE -----	11-4
Retention of FSC 6505 Materiel Following Annual Training -----	S10 -----	4-9

S

Sample Data Collection Assistance Visit Policy -----	S5 -----	9-3
Sample Data Collection Guideline and Sample Sectors -----	S5 -----	9-1

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Sample Data Collection Program (with Figure 4-1)-----	S1 -----	4-7
Sample Data Collection Program Introduction -----	S5 -----	9-1
Sample Data Collection Program Management Policy -----	S5 -----	9-1
Sample Data Collection Quality Control Process and Data Verification Policy-----	S5 -----	9-4
Sample Equipment Item and Manufacturer/Model Number Codes (for PMI)-----	S11 -----	12-5
Sample Memorandum of Maintenance Sustainment Support Coordination -----	S10 --	Appendix E
Sample Standard Operating Procedure for TOE Organizations (Combat Support Hospital) -----	S6 -----	E-1
SB 700-20 LINs-----	S5 -----	12-4
Scheduled Periodic Medical Equipment Maintenance -----	S10 -----	3-7
Scissor Jacks Placement-----	S4 -----	10-2
SC VIII APS Assets -----	S7 -----	3-2
Shipment of MEDCASE/SuperCEEP Items-----	MEDCASE -----	6-4
Similar Asset/Estimated FMV Worksheet-----	11 -----	A-1
Site Preparation Requirements Introduction -----	S5 -----	3-1
Site/Regional Project Team Activities—Assessments and Implementations -----	S5 -----	10-4
SLEP Process-----	S7 -----	9-2
Special Considerations -----	S10 -----	3-9
Special Eligibility Criteria-----	MEDCASE -----	2-2
Special MEDCASE/SuperCEEP Program Considerations Introduction-----	MEDCASE -----	15-1
Special Procedures -----	MEDCASE -----	12-5
Special Purpose Test, Measurement, and Diagnostic Equipment (TMDE-SP) Tables ----	S6 -----	F-1
Special Requirements for Submission and Approval (Routine) -----	MEDCASE -----	12-2
Specific Guidance Pertaining to Various Types of Materiel -----	S10 -----	1-3
Split Property Books-----	S4 -----	3-1
Stockage Lists -----	S10 -----	4-1
Sterilizer, Steam, 6530-01-431-6564 and 6530-01-442-8720 -----	S6 -----	2-9
Storage And Shipping Containers-----	S6 -----	1-3
Storage Requirements-----	S7 -----	5-8
Submission of Requirements-----	MEDCASE -----	3-7
Supply Class VIII Sustainment Requirements Process -----	S7 -----	A-1
Support For Class VIII Medical Materiel -----	S1 -----	2-1
Support Strategy -----	S5 -----	6-1
Supportability Analysis Introduction-----	S5 -----	6-1
Sustainment -----	S5 -----	10-8
Sustainment Fieldings-----	S4 -----	1-4

T

Table, Operating, Field, 6530-01-321-5592 -----	S6 -----	2-10
Table, Operating, Hospital (Field), 6530-01-353-9883-----	S6 -----	2-11
TAMMIS Enterprise-Wide Logistics System (TEWLS) -----	S1 -----	3-5
TARA Cycle Review -----	S5 -----	5-8
TARA Process -----	S5 -----	5-2
TARA Schedule-----	S5 -----	5-5
TB-MED 750-1, Draft Copy -----	11 -----	C-1
TDA Approval and Type Classification Exemption -----	MEDCASE -----	17-3

(Continued) 2006 CUMULATIVE INDEX - DA SB 8-75-11

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
Team Approach for TARA -----	S5 -----	5-4
Technology Assessment and Requirements Analysis Program Introduction -----	S5 -----	5-1
Technology Assessment and Requirements Analysis (TARA) -----	S1 -----	3-6
Technology Assessment and Requirements Analysis (TARA) Confidentiality-----	MEDCASE-----	17-3
Technology Assessment and Requirements Analysis (TARA) Coordination -----	MEDCASE-----	17-1
Technology Assessment and Requirements Analysis (TARA) Integration -----	MEDCASE-----	17-3
Technology Assessment and Requirements Analysis (TARA) Introduction -----	MEDCASE-----	17-1
Technology Assessment and Requirements Analysis (TARA) Methodology -----	MEDCASE-----	17-1
Technology Assessment and Requirements Analysis (TARA) Mission -----	MEDCASE-----	17-1
Technology Assessment and Requirements Analysis (TARA) Program Review -----	MEDCASE-----	17-3
Telecommunications Equipment -----	MEDCASE-----	13-4
Teleradiology Functionality-----	S5 -----	10-9
Testing Criteria (SLEP) -----	S7 -----	9-1
Test, Measurement, and Diagnostic Equipment (TMDE) -----	S10 -----	3-10
Test, Measurement, And Diagnostic Equipment (TMDE) Authorizations -----	S6 -----	1-4
The Army Centrally Managed Medical Potency and Dated (P&D) Materiel Program -----	S7 -----	4-1
The USAMMA CD ROM Is Available -----	S1 -----	1-3
The US Army Medical Materiel Agency (USAMMA) Centralized Class VIII Repair Parts Program AMEDD Maintenance Sustainment Program -----	S10 --Appendix C	
The USAMMA Forward Logistics Support Element (USAMMA FWD) -----	S7 -----	7-4
The USAMMA Medical Logistics Support Team (MLST) -----	S7 -----	7-1
The U.S. Army Medical Materiel Agency (USAMMA) -----	S1 -----	2-3
The U.S. Army Medical Materiel Agency Centralized Class VIII, Repair Parts Program--	S2 -----	1-5
TMDE Program Manager Address Change-----	S2 -----	1-5
Tool Kit, Medical Equipment Maintenance and Repair: Repairman's, NSN 5180-00-611-7923, LIN W45334 -----	S2 -----	1-5
Transmittal Request for New DOD Form DD 2282-----	S4 -----	12-2
Turnkey Acquisition-----	MEDCASE-----	13-4
Types of A2S-----	S4 -----	8-2
Types of MIPRs -----	MEDCASE-----	8-1

U

ULLS-G -----	S7 -----	8-3
Unit Assemblage Listings (UALs) – Bill of Materiel-----	S1 -----	4-8
Unit Status Reportable (USR) Medical Equipment -----	S10 -----	3-9
Universal Data Repository -----	S5 -----	12-4
Updating of Unit Assemblages -----	S5 -----	11-1
USAMMA MEDCASE/SuperCEEP Manager POC -----	S5 -----	2-3
USAMMA TMDE Calibration Support -----	S2 -----	1-6
USAMMA's Logistics Assistance Program -----	S6 -----	1-4
USAMMA's Logistics Assistance Program, Medical Maintenance Support-----	S10 -----	D-1
USAMMA's Medical Maintenance Operations Division On-line-----	S2 -----	1-6
Use of HEPA Filter With IMPACT 754 Ventilator-----	S6 -----	L-1
Use of Inspection Checklists -----	S10 -----	6-1

<u>SUBJECT</u>	<u>SB 8-75-</u>	<u>Page</u>
V		
Vaccines -----	S1 -----	3-7
Vendor Selection-----	S5 -----	10-5
Ventilator, 6530-01-464-0267 -----	S6 -----	2-11
Ventilator, Impact Model 754, NSN 6530-01-464-0267-----	S2 -----	1-6
W		
'W' and 'J' Relationships-----	S4 -----	6-1
Warranties -----	MEDCASE-----	15-4
War Reserve Requirements -----	S7 -----	2-1
Web-Accessible UA Products -----	S4 -----	11-4
Web MEDCASE Requirements and Execution (WebMRE) System Introduction -----	MEDCASE-----	10-1
WebMRE Access Form -----	MEDCASE-----	10-1
WebMRE/Theater Enterprise Wide Logistics System (TEWLS) -----	MEDCASE-----	10-1
Website Information On DOD/FDA Shelf Life Extension Program (SLEP) -----	S7 -----	9-5
Wholesale Supply Source Actions-----	MEDCASE-----	6-3
Wholesale Supply System (Requisitions) Introduction -----	MEDCASE-----	6-1
X		
X-Ray Apparatus, Dental, Handheld, 6525-01-425-5216 -----	S6 -----	2-12
X-Ray Apparatus, Radiographic, Med, 6525-01-384-9296-----	S6 -----	2-12
X-Ray App Rad/Fluor, C-Arm, 6525-01-452-0956-----	S6 -----	2-12

SECTION 1. MEDICAL EQUIPMENT INFORMATION

1-1. ABAXIS CLINICAL CHEMISTRY ANALYZER, MODEL PICCOLO, 6630-01-415-1593

a. The Medical Maintenance Section staff at the US Army Medical Materiel Center, Southwest Asia (USAMMC-SWA) identified possible problems with the Piccolo Model of the Abaxis Chemistry Analyzer. They have recommended that operators increase the regimen of cleaning the printer and results card slot daily and the air filter bi-weekly. It only takes about 5 minutes to do all of it. All you need is some canned air and a Phillips screwdriver. This is no guarantee to alleviate the problems, but it is a mitigating effort worth doing.

b. Abaxis has a FAQ site that may be useful. Please see www.abaxis.com.

1-2. AIRSEP OXYGEN CONCENTRATOR, 6515-01-434-4629

a. When testing the AIRSEP oxygen concentrator for purity, it is recommended that you use a Fluke Biomedical Gas Flow Analyzer, model VT Plus or equivalent O₂ measuring device with a waveform-producing capability. The VT Plus produces a waveform which enables you to identify occasional O₂ output purity fluctuations. This waveform should remain fairly level and fluctuation of the oxygen levels should be minimal.

b. When using alternative test equipment to verify the concentrator, it may appear as though the concentrator is passing the purity tests; however, visibility of intermittent fluctuations where the purity drops below acceptable oxygen levels may be unseen. Low purity is primarily a result of bad sieve beds. Additionally, a bad mixing tank can also cause fluctuations in the oxygen purity. Anytime you replace the sieve bed assembly (part #BE001-1R), you should also replace the mixing tank assembly (part #TA-089-2).

c. There are two versions of this O₂ concentrator on the market. The newer version includes a design change that is not in the OEM service manual. In the older version, the pressure outlet is located on the right side as you face the front of the unit. In the newer version, the pressure outlet is in the rear of the unit; however, access it from the right side. Remove the right side cover and locate the tube with the pressure outlet attached. Connect your pressure gauge to this tube. All other aspects of the testing are the same.

1-3. ARTHROSCOPIC SYSTEM, 6515-01-431-9631

a. During preventive maintenance checks and services (PMCS) on the Olympus-America, Inc., Arthroscope, the fiber optic bundle should be inspected carefully, ensuring that it still has 80 percent light conductivity and no breaks in the center of the bundle. PMCS includes a visual inspection of the equipment for any damaged parts or deficiencies that will prevent the unit from being used or sterilized.

b. The Arthroscope System comes with one each of the following items:

3093, Fiberoptic cable, 6515-01-139-8567
7584, Single sheet with stopcock (Obturator, Conical), 6515-01-166-3504
7599, Trocar, Pyramid, 6515-01-166-3528
7600, Trocar, Blunt Tip Sleeve, 6515-01-173-2452
7595, Scope, 6515-01-171-6050

1-4. AVAILABLE CD - OPERATOR AND MAINTENANCE LITERATURE

a. Operator and maintenance literature for medical equipment is available in portable document format (pdf) on CDs. Located at appendices A, B, C, D, E, F, and G are the table of contents for seven CDs that are now available. To obtain a copy of this literature, go to USAMMA's website at www.usamma.army.mil and select the button "Medical Equipment Literature CDs" or call DSN 343-4379 or commercial 301-619-4379.

b. In February 2007, a new CD will be available. Check USAMMA's website for the list of manuals on this CD and the order form.

1-5. BELMONT BLOOD FLUID WARMER, MODEL FMS 2000, 6515-01-465-2059

For those technicians who may have been unclear on the electrical leakage testing of the FMS 2000, here is additional information from the manufacturer. The Section V., *Maintenance and Calibration Setup* of the service manual addresses the use of a 12-to-16-gauge cannula to interface with the administration set during electrical safety testing. The purpose of the cannula in this test provides an electrical connection to the fluid for verification that the path is electrically safe. A larger or smaller cannula can be used for the electrical pathway. In the event that only a smaller 18-gauge cannula is available, it can be used to test the leakage current; however, flow rate testing if performed will be reduced as the unit will only allow 300 mmHg of back pressure. It is advisable to obtain a larger bore cannula for verification and performance testing the flow rate.

1-6. COMPUTED RADIOGRAPHY, OREX PCCR 1417, 6525-01-504-5002

a. Cassette Error and Replacement Issues

(1) A common problem with the Orex PcCR 1417 system is that when the cassettes are being erased or scanned, an error will sometimes pop up on the screen. The Error reads "WO Sensor ON State Fail." To correct this, Source One's guidance was to pull down on the cassette tabs and tap the closed end of the cassette on a table. This ensures that the plate on the inside of the cassette is positioned at the very bottom of the cassette. When the cassette is run again, the error message may be gone.

(2) In the event that this does not correct the problem, Source One recommends that the plate be taken out of the cassette, turned 180 degrees, and reinstalled back into the cassette. Make sure to position the plate to the bottom of the

cassette by again pulling down on the tabs and tapping the cassette on a table. If this does not correct the problem, it is time to order another cassette. Doing these extra steps to increase the life of your cassette w/plate may help save precious resources.

b. Computed Radiography System Software Issues

(1) To solve any software issues, the USAMMA has made a DVD System Disk for this system. With this disk you may reload the complete software on the hard drive on any version of the scanner. Along with the software are the latest manual updates, and the instructions and software needed to configure the system for DICOM In, Modality Worklist, Remote Patient Entry, and Diagnostic Viewer. The USAMMA has made (and periodically updates) a list of all the scanners by serial number and lists the correct software to use.

(2) Questions or comments should be directed to 570-895-7734 or DSN 795-7734.

1-7. DEFENSE REUTILIZATION AND MARKETING SERVICE (DRMS)

a. If you are planning to send medical equipment to the Defense Reutilization Marketing Office (DRMO), the DRMS has a web site which may help you prepare the equipment for disposal. This web page contains the Safety Alert Latent Defect (SALD) Guidance which provides instructions for preparing material for disposal. Not all material requires preparation, so you will have to look up the product you are disposing. The materials are listed by the National Item Identification Number (NIIN), the last nine numbers of the National stock number (NSN). For example, the Anesthesia Apparatus Model 885A, NIIN 01-185-8446, has a SALD which requires the removal of the anesthesia head, to include the vaporizer before the material is accepted by DRMO. The web page is **www.drms.dla.mil/sald/SaldForm**.

b. For any questions contact Medical Scientific Division, Materiel Acquisition Directorate, 301-619-4382 or DSN 343-4382.

1-8. DEFTOS DENTAL OPERATING UNIT, FIELD, 6520-01-493-3759

a. When unpacking the Bell Dental Products Field Dental Operating Units that are sent to the medical maintenance operations depots for maintenance and repair, the hoses in pouch Number 2 are found to be pinched due to improper packing. When the unit is packed backwards (front of unit facing back of case) and when the contents of pouch number 2 are not properly packed, the result is damaged dental hoses.

b. As stated in the operating and maintenance manual, the unit should always be packed in the case with the front of the unit facing the front of the storage case. This will protect the circuit breakers as well as the connectors, which are on the back of the unit. This will also give a flat surface to help protect the contents of pouch number 2 from being pinched. When packing the pouches, the hoses and cords should be coiled so that the diameter of each coil is as wide as possible to ensure that the pouches are not too thick when placing them into the storage case. When the pouches are too thick, the hoses tend to get pinched from the force placed on them. The laminated instruction cards should also be placed between pouch number 2 and the instrument tray assembly to ensure that the tray support doesn't pinch the hoses.

1-9. DYNAMICS INTRAVENOUS INFUSION PUMP, 6515-01-498-2252

The Infusion Dynamics Intravenous Infusion Pump has an accessory called the Crystalloid and Colloid Pump Cartridge and IV Set (part number 0040-0050). Please be aware that the date on the back of the package is the date the cartridge was manufactured. There is no expiration date printed on the package. The manufacturer explained that a 3-year shelf life was specified to the Army when the infusion pump was acquired. Although it has not been tested in extreme heat, the manufacturer states that the 3-year shelf life would be shortened to a 1-year shelf life if the IV Set was exposed to such conditions.

1-10. EQUIPMENT ITEMS SUPPORT AND CONSUMABLES HANDBOOKS

a. These handbooks were developed to aid units in the identification of the start-up and re-supply consumable packages that are required to operate medical items of equipment issued by the USAMMA fielding teams.

b. The handbooks contain the items by NSN, nomenclature, part number, quantity, unit of issue, unit price, total price, manufacturer, shelf life, refrigerated item, ship time, system description, and USAMMA points of contact. The handbooks can be used to quickly identify shortage items at time of issue, during unit inventory, and to re-supply the consumables.

c. Following is a list of handbooks now available:

Handbook	Last Reviewed
UA 2256 Ground Ambulance Equipment Items	19 December 2006
UA 2257 Air Ambulance Equipment Items	19 December 2006
UA 2261 Medical Patient Hold	19 December 2006
UA 2267 Forward Surgical Team Equipment Items Support And Consumables	19 December 2006
UA 4003 Optical Fabrication Unit	21 November 2006
UA 4714 Dental Equipment Set - Dental Support and Consumables	28 August 2006
UA 4720 Dental X-Ray	28 August 2006
UA 4901 Veterinary Equipment Set Service Field	21 November 2006
UA 4905 VES Detachment 50 Patient Small Animal Support and Consumables	27 November 2006
UA 4912 Vet Surgical Instrument & Supply Set	28 August 2006
UA 4913 Vet Equipment Set Service Field	25 September 2006
UA 4914 Veterinarian Set	31 October 2006

UA 5257 Air Ambulance Equipment Items Support And Consumables	5 October 2006
UA 5267 Forward Surgical Team Equipment Items Support And Consumables	31 October 2006
UA M305 Radiology	28 August 2006
UA M432 Medical Materiel Set – Radiology Computerized Tomography	25 September 2006
UA N301 Operating Room	25 September 2006
UA N302 Central Medical Materiel Set	31 October 2006
UA N303 MMS Laboratory General Deployable Medical System Equipment Set	19 December 2006
UA N703 MMS Laboratory General, 164-BED CSH CO Equipment Set	5 October 2006
UA N308 Medical Materiel Set Triage EMT Pre-OP Support and Consumables	31 October 2006
UA N309 Post-OP ICU Ward	25 September 2006
UA N310 Intermediate Care	31 October 2006
UA N311 Minimal Care Ward	28 August 2006
UA N334 MMS X-Ray Lowcap	28 August 2006
UA N503 MMS Laboratory General 84 BED CSH Company Equipment Set	19 December 2006
UA N703 MMS Laboratory General, 164-BED	19 December 2006

d. The current versions of the handbooks are available on the USAMMA website at www.usamma.army.mil. Select "Reference," then "Equipment Handbooks." All available handbooks will be listed; select the desired handbook.

1-11. HEMACOOOL, BLOOD REFRIGERATOR, 4110-01-506-0895

a. Charging lithium batteries:

(1) Refer to HemaCool Operating Instructions for battery charging (pages 1-16 to 1-17).

(2) Lithium batteries work by shuttling lithium ions between anode and cathode of the battery. The anode, source of the ions and electrons, is elemental lithium (or a lithium-containing compound) and the cathode, receptor of the ions and electrons, is a material capable of accepting lithium ions into its structure. When a battery is discharged, lithium ions flow from the anode to the cathode, accompanied by electrons. This flow of electrons is electrical current and can be used to power HemaCool data. The battery can be charged by supplying an external electric current, which drives the lithium ions back to the anode. This charging process "resets" the anode and cathode so that the battery can once again power your HemaCool data through a hectic day.

(3) A lithium-ion battery provides 300-500 discharge/charge cycles. The battery prefers a partial, rather than a full, discharge. Frequent full discharges should be avoided when possible. Instead, charge the battery more often or use a larger battery. There is no concern of memory when applying unscheduled charges.

(4) Aging of lithium-ion is an issue that is often ignored. A lithium-ion battery in use typically lasts between 2-3 years. The capacity loss manifests itself in increased internal resistance caused by oxidation.

(5) Avoid frequent full discharges because this puts additional strain on the battery. Several partial discharges with frequent recharges are better for lithium-ion than one deep one. Recharging a partially charged lithium-ion does not cause harm because there is no memory. (In this respect, lithium-ion differs from nickel-based batteries.) Short battery life in a HemaCool data is mainly caused by heat rather than charge / discharge patterns.

b. Charging Absorption Glass Mat (AGM) batteries:

(1) AGM sealed battery technology was originally developed in 1985 for military aircraft where power, weight, safety, and reliability were paramount considerations. In AGM sealed batteries, the acid is absorbed between the plates and immobilized by a very fine fiberglass mat. No silica gel is necessary. This glass mat absorbs and immobilizes the acid while still keeping the acid available to the plates. This allows a fast reaction between acid and plate material.

(2) The AGM battery has an extremely low internal electrical resistance. This, combined with faster acid migration, allows the AGM batteries to deliver and absorb higher rates of amperage than other sealed batteries during discharging and charging. In addition, AGM technology batteries can be charged at normal lead-acid regulated charging voltages; therefore, it is not necessary to recalibrate charging systems or purchase special chargers. Battery life is reduced at higher temperatures – for every 15 degrees F over 77, battery life is cut in half.

c. Technical Inspections/Service: The USAMMA has published procedures for performing a technical inspection/service for the blood refrigerator unit. See appendix H of this publication for additional information.

1-12. IMPACT INSTRUMENTATION, INC., VENTILATOR, MODEL 754, 6530-01-464-0267

a. From time to time, IMPACT Instrumentation, Inc., will provide documentation to inform our customers of changes, additions, and general tips/solutions for their product line. This information will come in the PDF document called a Technical Service Bulletin (TSB). Their first TSB concerns a change in the fuse holder for the ventilator, model 754.

b. Technical information for the IMPACT products is available for viewing on their website at www.impactii.com. Look under "Support," "Technical Articles." They have also made available a special military FTP site to download operation/service

manuals and software for their products. Go to www.impactii.com/shared/calsoft.htm. The username is *calsoft* and the password is *LV980F71*. The password is case sensitive.

1-13. INVASIVE MONITORING OF mA FOR THE PHILIPS BV 300 C-ARM

- a. There is an internal closed-loop monitoring circuit for mA that compares the actual mA with the set mA. If there is a difference, the system adjusts itself. However, the capability exists to read mA invasively.
- b. Refer to appendix I for steps and graphic illustrations of this procedure.

1-14. LIFEPAK 10 DEFIBRILLATOR/MONITOR, 6515-01-453-4003

- a. Tolerances vary on different defibrillator brands. For the Physio Control Lifepak 10, the acceptable tolerance for the energy delivered is plus or minus 7%. This value is mentioned in the Service Manual (pages 3-9 and 3-10) in the *Testing and Troubleshooting* section of the book.
- b. Currently, the military uses the Impulse 4000 Defibrillator and Transcutaneous Pacer Analyzer as one of the testing medical devices to check for the defibrillator's accuracy output. The Impulse 4000 testing equipment uses an automated testing function that is loaded by the manufacturer to test the Lifepak 10. Although the testing tolerance limits are set at a default of 15%, which is not the same value as the Physio Control's tolerance, the tester is still adjustable to allow for the manufacturer's different tolerances when the operator chooses to reconfigure the testing device. Ensure that the Impulse 4000 is set to the 7% tolerance. Please note that while the new tolerance may be set at 7%, the testing equipment will default to 15% on the lower 5 joules setting.
- c. Be advised that during testing of the Lifepak 10 the amount of watts delivered should be the same as listed in the service manual.

1-15. NARKOMED M ANESTHESIA APPARATUS, 6515-01-457-1840

Draeger Medical does not provide verification procedures for the external O₂ and N₂O regulators used on the NARKOMED M anesthesia machine. The USAMMA has developed procedures to verify the performance of the regulators. The test procedures verify that the regulators operate according to Flotec specifications.

- Appendix J illustrates the verification steps for the O₂ regulator, part #RN510-600.
- Appendix K illustrates the verification steps for the N₂O regulator, part #RNJM05-6005.

1-16. PRE-DEPLOYMENT TRAINING OFFERED

- a. The DoD Biomedical Repair School, Sheppard Air Force Base, Texas, offers a 2-week pre-deployment training course for Medical Equipment Repairers. The course is an agenda-based course. Subjects taught are based on feedback from the current

theater of operation in SWA. The training is intended for Air Force personnel prior to deployment, and is limited to 8 students. A new class starts approximately every 2 weeks. Vacancies not filled by Air Force personnel are given to Army personnel on a first-come, first-serve basis. The course is free; however, attendees must pay for lodging, meals and all transportation costs to and from their home station and at the TDY location, per diem. FY07 per diem rates for Sheppard Air Force Base are \$60 for lodging and \$36 dollars for meals. It is highly recommended that units include this course as an option as part of their pre-deployment plan for their equipment repairers.

b. The first week of training is geared towards high maintenance items such as the Impact 754M ventilator, Zoll Defibrillator, the Piccolo Chemistry Analyzer and other items based on request from the theater. The second week of training deals primarily with preventive maintenance, troubleshooting and repair of the Expeditionary Deployable Oxygen Concentrator System (EDOCS) model 120.

c. For more information about the course or how to attend please call the Army senior instructor at 940-676-8190.

1-17. POGS MEDICAL OXYGEN GENERATOR, 6530-01-533-4481

a. The POGS33C is the oxygen concentrator from ONSITE GAS SYSTEMS. It is capable of delivering 33 LPM while maintaining 93% - 96% oxygen. During setup it is imperative that the O₂ analyzer be calibrated correctly. While the calibration does not effect the actual production of O₂, the analyzer readings are used to alert operators in the event of low O₂ production.

(1) The generator needs to run for 45 minutes prior to calibration.

(2) During this period, install three flow meters and set them to a combined flow of 30 LPM. This allows the existing gases in the O₂ tank to be purged by the O₂ from the sieve beds.

(3) After the 45 min start-up period, factory representatives advise to first calibrate at the High range, then the Low (20.9%) and then the High again.

b. The VT PLUS gas flow analyzer may be used to calibrate the high range of the O₂ analyzer. Build a manifold to connect three flow meters to the VT PLUS using tubing, swivel connectors, and zip ties.

c. The POGS33C uses a model MedAir 2000 CO (carbon monoxide) and Dew Point monitor from ENMET Corporation which is mounted internally. If there is an alarm coming from within the generator, although one should not rule out the possibility that high levels of CO are present, it is possible that the MedAir 2000 is out of calibration.

(1) The following is a list of items ENMET Corporation recommends to verify the calibration of the MedAir 2000:

Gas Regulator	037-00-500	\$145
CO Cylinder	03219-020	\$50
O ₂ Cylinder (20.9%)	03296-209	\$50
Case (Optional)	730-83-000	\$20

(2) Additional information is available in the MEDAIR 2000 manual which should accompany the POGS 33C literature.

1-18. PREVENTIVE MAINTENANCE OF THE HEATER FOR THE WATER DISTRIBUTION AND WASTE WATER MANAGEMENT SYSTEM

a. The electric water heater, NSN 4520-01-493-7423, is to provide a means of keeping the water in the potable water lines from freezing when the system is operated in a cold environment.

b. The heater will require internal cleaning after each use. Do not operate the heater without flowing water. This will damage the heater. Unplug the power connection from the power box. Disconnect potable water hoses from the heater. Empty the water from the heater barrel by tipping the water heater and allow the water to empty from the quick disconnect fittings. Now remove the square tank end and the gasket. Clean interior and reassembly with a new gasket.

1-19. PUMP, INFUSION, 6515-01-452-0625 AND 6515-01-486-4310

a. Battery Operation Testing. When performing the battery operation test portion of the system function test for the Medsystem III 2863 and 2865 as defined on page 3-10 of the OEM service manual, Alaris Medical Systems has identified a technique that can save time and money.

(1) A one-inch square piece of red (other colors not detected) silicone rubber can be used instead of a mini-set cassette filled with water. In addition to decreased costs, this also reduces the chance of the unit alarming during this test as well.

(2) Use a modified fluid side occlusion cassettes (reference appendix B of the OEM service manual, page A-8) and place a one-inch square piece of red silicone in the air in-line detector. Then, perform tests according IAW page 3-10 of the OEM service manual.

(3) Modification of the fluid side occlusion cassette should be done as follows. Remove the rubber boot from the plunger stem and cut away all of the tubing from the cassette. Additionally the small square rubber film on top of the cassette must be removed while the large round rubber film needs to be left in place.

(4) A 12" X 12" sheet of red rubber silicone (PN 8632K34) is available from McMaster Carr Company; telephone 404-346-7000 and 404-629-6500. This silicone can be used to make multiple one-inch squares of rubber. The use of this silicone will save a lot of money by not having to purchase more mini-sets (PN 28125).

b. Lithium Battery Failure Indication. When the Infusion Pump is first turned on after removal from extended periods of storage, it is not uncommon for the pump to indicate a lithium battery failure. With the exception of clearly visible physical damage, the ensuing procedure should be followed prior replacing the lithium battery.

- (1) Charge the unit for 24 hours.
- (2) After the unit has charged for 24 hours, place the unit into maintenance mode and connect it to a computer with FMS software supplied by the Alaris.
- (3) Re-enter the pump's specific information using the software.
- (4) Remove the pump from the computer.
- (5) Turn the unit off and unplug the unit from A/C.
- (6) Start the unit normally. Confirm the unit's serial number is displayed on the screen with no errors. If the serial number is displayed and no errors appear, the unit still requires a software calibration.
- (7) Place the unit back into maintenance mode and hook it up to the computer and follow your normal procedures for calibration and clearing the error logs.
- (8) If there are errors, replace the lithium battery.

c. Alaris Medical Systems Technical Information and Software Updates. Alaris Medical Systems has published guidance in an attempt to make technical information and software updates for their models: 2850, 2863, and 2865 series infusion pump more accessible and user friendly.

(1) Their web address for technical support, information regarding service bulletins, software patches and upgrades is
<http://alaris.pint.com/na/technical/bio.shtml>.

(2) To order a Technical Service Bulletin, please call ALARIS Medical Systems Customer Services at 800-482-4822.

(3) To register for online Technical Service Bulletin Access, please call Alaris Medical Systems Technical Support at 800-854-7128, extension 6003.

d. Drive Motor Failure. The Hill Medical Maintenance Operations Division has noticed an increase in the Drive Module Kit (P/N 2860745) needing to be replaced. They have found that in some circumstances the problem can be fixed with a Motor Kit (P/N 2860760).

e. Troubleshooting. Alaris Medical Systems published a troubleshooting guide to use when a pump latch closed alarm is displayed and the appropriate corrective action.

Pumping latch closed alarms can be reduced with the following practices:

- * Turn the pump on **before** inserting the cassette into the pump.
- * Angle the cassette upward and in when loading.
- * Be sure to stop the channel **before** removing the cassette from the pump.
- * Fully extend the cassette slide clamp when removing the cassette from the pump.

f. To correct a latch that has closed in the up position causing a pump latch closed alarm:

(1) Use only your finger to gently push down the closed pumping latch jaw until it snaps open, the down position.

(2) If the pumping latch jaw is visibly broken, the channel should be disabled by pressing the "Service" key.

(3) **DO NOT press the "Service" key unless you wish to disable the channel.**

1-20. REPLACEMENT BATTERIES FROM OTHER THAN ORIGINAL EQUIPMENT MANUFACTURER (OEM) SOURCES

a. While rechargeable batteries are available from the OEM, we have found an alternate source that may save you money.

b. Please check out the following www.batteryclinic.com. They are also available at telephones 800-786-1511 or 706-739-0407.

c. The company has a large number of hard to find or expensive replacement batteries, such as for the Sonosite 180 Handheld Ultrasound.

d. The OEM price - \$395.00, Battery Clinic price - \$108.00, and that includes cracking the case, removal of the old batteries, replacement of same and gluing it together.

e. Batteries for the Medtronic LP-10 Defibrillator OEM price - \$90.00, Battery Clinic price - \$35.00. The Regional Training Site – Fort Gordon, GA, has used this source of supply for batteries with great success.

1-21. SURGICAL LIGHT, 6240-01-455-7873, FIELD OPERATION TABLE, 6530-01-321-5592

a. Electrical Safety testing of the surgical light (NSN 6240-01-455-7873) has disclosed that an unacceptable leakage current level exists in some of the lights that are part of the field operating table. Additional information was provided by RTS-Medical personnel at Fort McCoy, WI, that relates to the JT-101 and YH75A power supply PCBs.

b. If your FST OR table surgical lights have an electrical leakage problem (>300 uA) follow these instructions.

Step 1: Remove the plastic terminal cover at the bottom of the lamp column and make a small mark with a permanent marker on the red lead to the power supply PCB that is connected to the black lead of the incoming power cord. Continue with the disassembly of the lamp by removing the base joint assembly and middle knuckle of the lamp. Remove the two screws securing the PCB heat sink about halfway up the lamp column. Undo the wire nuts at both ends and slide the PCB out the bottom of the column.

Step 2: Identify the board you are modifying and locate the hot lead.

(a) If you have an YH75A board, its number will be found on the right edge of the component side of the board. The YH75A hot lead is located on the opposite side from the part number and heat sink ground lug viewed from the component side. Trace the lead from this wire and it goes to the line fuse.

(b) A JT-101 board will be labeled on the "run" side, in the upper middle. The JT-101 board is laid out with the hot lead on the same side as the heat sink ground lug, going to a fusible link, (the very thin wire overlaying the resistor symbol silk screened on the component side). Don't be concerned if the black mark you made in step one seems to be reversed. Many of these boards were connected backwards during assembly. The fuse should always be connected to the incoming, (hot) side. If your connection is reversed, correct it now by gently scraping off the small black mark and applying a larger one to the hot lead. You may also mark the other red wire (neutral) with a white marker. This precludes any need to de-solder and replace the existing red wires.

Step 3: "Float" or electrically disconnect the ground pad of the PCB. Unscrew the lug from the heat sink. Use a small diagonal cutter and snip off the lug flush with the surface of the PCB. Snip off the green ground wire where it enters the PCB. (No soldering iron needed for this step.)

Step 4: Connect the isolated ground lug to the neutral lead. This step diverts risk current to neutral. Some risk current is induced due to the proximity of the runs on this board. The balance probably comes through the two filter capacitors which terminate on the ground pad. These caps are present on both power supply modules. They are thin film ceramic caps with high dielectric ratings (350 V to 3.3 kV on the samples encountered).

Step 5: Acquire a 28 AWG stranded signal wire, strip it and pull out a single strand. This should measure about .010 inch in diameter. For comparison, the fusible link wire found on the JT-101 board measures about .007-inch. Solder this wire between the ground pad and the neutral pad. Use of 60/40 solder with rosin flux will facilitate this operation and probably eliminate the need for additional solder. This thin wire will carry risk current and protect the board if an equipment malfunction occurs.

Step 6: Place a ring terminal on the line cord ground lead and connect it to the chassis with a 6-32 screw and nut. Drill a hole between and slightly below the screw holes for the line cord terminal cover. Face the screw head out and the cover should fit over it during reassembly of the lamp.

Step 7: Reassemble and safety test the lamp using normal and reverse polarity. You may also open and close the ground switch as part of the test. This should bring the electrical leakage within (<300 uA) acceptable limits.

1-22. TEST, MEASUREMENT AND DIAGNOSTICS (TMDE) PROGRAM MANAGER ADDRESS

Please ensure that you have the correct address in Block 1A of DA Form 4062, TMDE Acquisition Approval Analysis Data, and the correct "FOR" line on the Acquisition Memorandum. The address should read:

TMDE Program Manager
SFAE-CSS-CS-T
Redstone Arsenal, AL 35898-5000.

Please make sure to use this address on your submitted memo and DA Form 4062.

**1-23. TOOL KIT, MEDICAL EQUIPMENT MAINTENANCE AND REPAIR:
REPAIRMAN'S, 5180-00-611-7923, LIN W45334**

a. General Services Administration (GSA) is the integrated material manager for this tool kit. If your organization requires the tool kit and wishes to order one, please submit a DA Form 1348, Requisition Request Form, or GSA SF Form 344, Multiuse Standard Requisitioning/Issue System Document. The request can be submitted through your standard supply requisition system or faxed to the GSA at 816-926-7971.

b. Refer to SC 5180-8-A14, Tool Kit Medical Equipment Maintenance and Repair: Repairman's. This SC can be found on the USAMMA's website at www.usamma.army.mil.

c. If you need additional information please contact GSA at 816-926-6998.

d. If you have any questions or comments please call the USAMMA Materiel Acquisition Directorate, Medical Scientific Division (MMO-AL) at DSN 343-4382 or commercial 301-619-4382.

1-24. VALLEYLAB ELECTROSURGICAL APPARATUS, 6515-01-309-6647

a. There are two versions of the Valleylab, Force 2, electrosurgical unit. The PRSF board in the Force 2 generator changed in 1995. You can determine the year of manufacturer of your equipment by the serial number. The charge below is an F6E9999T breakdown example.

F6E9999T Breakdown				
F	6	E	9999	T
Force 2	Last number of the year of manufacturer	Month of manufacture	Body of 4 numbers indicates it was manufactured 1985 thru 1995 and was the 9999th unit made. A body of 5 numbers indicates it was manufactured from 1995 thru present.	Also stands for Force 2
In this example the Force 2 was manufactured in May of 1986 and it was the 9999 th unit manufactured.				

b. Units manufactured before 1995 have a verification procedure as well as a calibration procedure in the OEM service manual. Units manufactured after 1995 have only a calibration procedure.

c. It has been determined that the default auto sequence in the Fluke Biomedical 454A Electrosurgical Analyzer does not meet Valleylab's standard for testing the Force 2 generators. An auto sequence can be manually created in the 454A that

will meet the Valleylab test standard of a 200 ohm load when doing RF output tests. The following tests must be entered into the auto sequence.

(1) Generator Output tests with a 300 ohm load should be at the following settings.

Coag	30 Watts
	120 Watts
Pure Cut	300 Watts
Blend 1	250 Watts
Blend 2	200 Watts
Blend 3	150 Watts
Microbipolar	70 Watts

(2) RF Leakage tests with a 200 ohm load, both active and dispersive leads, should be used at the following settings. Use the following identified wattage setting.

Pure Cut	35	55	75	95	115	135	155	175	195	300
Coag	55	75	105	115	120					
Microbipolar	70									

d. Do not use a disposable pencil to test the RF Leakage; this will give you false readings. Use the active accessory and activate it using the footswitch.

1-25. VENTILATOR, 6530-01-464-0267

a. Total Flow Backup Message.

Sometimes the 754M ventilator fails to generate a "**Total Flow Backup**" error/alarm/message when the flow is obstructed.

(1) The black bushing (P/N 340-0019-00) between the compressor air inlet assembly and the compressor barb eventually stretches and develops a leak allowing the compressor to pull air from inside the ventilator. When this occurs, the ventilator will not generate a "Total Flow Backup" alarm even though partially occluding the compressor inlet fitting.

(2) Follow the steps below for generating the "Total Flow Backup" alarm:

- (a) Ensure that the settings are correct.
- (b) Unscrew the 22mm gas outlet adapter from the manifold assembly.
- (c) Remove the 400m transducer screen from the manifold assembly.
- (d) Let the ventilator cycle 4 to 5 breaths.
- (e) The "Total Flow Backup" alarm should occur.
- (f) Press the Mute/Cancel push-button. The alarm LED and audible alarm should turn off and the AMC message should remain.

(3) If the preceding test failed to produce a "Total Flow Backup" error/alarm, verify that the black bushing between the compressor air inlet assembly and the compressor barb is functioning properly.

b. Incorrect Battery Charging Voltage

During routine checks of the 754M Ventilator, if the battery charging voltage is below the tolerance voltage of 12 volts DC, check the output of U1 on the motor drive circuit board. The part number for the motor drive board is 702-0754-05. The part number for U1 is 055-3578-00.

c. Air intake manifold servicing/cleaning for the 754M.

(1) While performing PMCS on the 754M Impact Ventilator, if there is a failure to produce sufficient air flow (6.01 lpm) on either the O₂ or air regulated by the manual valve control test fixture, it can be traced back to the O₂/air intake manifold.

(2) To correct this problem, remove the intake manifold from the ventilator. Disassemble the variable orifice valves from both O₂ and regulated air sections. After locating and removing the 400 micro filter screen and o-ring, submerge remaining aluminum blocks in 70% alcohol solution. Use canned air to blow dry block and orifices. Swab a few drops of alcohol into the flow ports of the four variable orifice valves and use canned air to blow dry. Reassemble manifold and perform an air flow test. The 400 micron screen can also be ultrasonically cleaned or canned air may be used to clean as needed.

(3) If there is a failure to produce sufficient air flow on either the O₂ or Air outputs, and you suspect the problem is due to dirty 500 micron screen transducers contact your supporting Medical Maintenance Division for repair.

d. HEPA Filtration and Premature Compressor Failure.

The 754M ventilator air entrainment port does not come standard with a HEPA filter installed. When the ventilator is operated in a clean environment like a hospital, a HEPA filter covering the air-entrainment port is generally not needed. However, it is recommended that when the ventilator is operated in an environment exposed to higher than normal levels of airborne contaminants that a HEPA filter be installed. See appendix L for additional information concerning HEPA Filtration.

1-26. ZOLL DEFIBRILLATOR, MONITOR RECORDER, 6516-01-515-4197

Non-Invasive Blood Pressure (NIBP) Leak Testing Procedure

(1) Zoll Medical Corporation is in the process of publishing revised NIBP leak testing limits (PM Procedure #20.0) to reflect the variances between the two different testing methodologies associated with different types of NIBP Analyzers.

(2) Zoll's service manual calls for a BIO-TEK BP Pump NIBP Monitor Analyzer or equivalent in its testing procedures. The requirement to identify two different limits is based on the use of a test cuff when using the DNI CUFFLINK Analyzer.

(3) Zoll has identified the following leak test limits for the two types of Analyzers:

(a) BIO-TEK BP PUMP NIBP MONITOR ANALYZER - No change.

A volume leak reading less than or equal to 4 mmHg, the unit passes the test.

A volume leak reading greater than 4 mmHg; the unit fails the leak test.

(b) DNI CUFFLINK ANALYZER

A volume leak reading less than or equal to 10 mmHg - the unit passes the test.

A volume leak reading greater than 10 mmHg – the unit fails the test.

(4) This information provided by the Senior Technical Support Representative, Zoll Medical Corporation. Phone 1-800-242-9150, ext. 9195; e-mail jtoma@zoll.com.

APPENDIX A: CD 1 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 1*

10/20 Standards, Maintenance Allocation Chart, and Equipment List for Reportable Medical Equipment

6230-01-481-2214	Floodlight Emergency, Med-Tent-LT
<u>Operator Guide and Parts List</u>	
*6515-00-137-6511	Electrosurgical Apparatus Portable, LM-90
<u>Service Manual</u>	
<u>User Manual</u>	
6515-01-279-6450	Monitor Oxygen Battery Power, 5120
<u>Operation and Maintenance Manual</u>	
<u>Service Manual</u>	
6515-01-309-6647	Electrosurgical Apparatus Portable, Force 2
<u>Service Manual</u>	
<u>TM 8-6515-003-24&P</u>	
6515-01-327-6798	Concentrator Oxygen, AS 005-1
<u>Patient Manual</u>	
6515-01-429-1381	Defibrillator/Monitor-Recorder, Lifepak 10
6515-01-453-4003	
<u>Operating Instructions</u>	
<u>Service Manual</u>	
6515-01-434-4629	Concentrator Oxygen, AS 005-4
<u>Service Manual</u>	
6530-01-321-5592	Table Operating Field (FST)
<u>Assembly and Packing Instructions</u>	
6530-01-325-9299	Ventilator Volume Portable, Bear 33
<u>Maintenance Manual</u>	
<u>Clinical Instruction Manual</u>	
6630-01-411-2568	Analyzer, Clinical Chemistry, I-Stat 111000
<u>System Manual</u>	
6630-01-415-1593	Analyzer Blood, Piccolo
<u>Operator's Manual</u>	

(continued) APPENDIX A: CD 1 TABLE OF CONTENTS

*6640-01-257-1944 Centrifuge Laboratory, Microhematocrit, Compur 1100
6640-01-068-9612
Operating Manual and Servicing Instructions

6640-01-326-1590 Rotator Laboratory, 14-251-200
Instructions

6640-01-431-5696 Rotator Laboratory, 1314
Operation Manual

*** For parts support call Medical Maintenance Support Division, Utah (commercial 801-586-4949/4950 or DSN 586-4949/4950, fax X5058).**

APPENDIX B: CD 2 TABLE OF CONTENTS

**Operator & Maintenance
Literature for Medical Equipment
*Disc 2***

4110-01-451-2356 <u>Maintenance Manual</u>	Refrigerator Solid State Biological, M-30TR
6515-00-137-6511 Service Manual	Electrosurgical Apparatus, Portable, SSE2L
6515-01-355-6479 <u>Operation and Maintenance Manual</u>	Vaporizer Anesthesia Drawover, 1101-9001-000
6515-01-378-4176 Operator's Manual Service Manual	Craniotome Power System, MD030
6515-01-414-3607 Service Manual Operation and Maintenance Manual	Cryosurgical System, CE-2000
6515-01-423-5796 6515-01-423-5872 <u>User's Guide</u> <u>Calibration/Maintenance Manual</u> <u>Schematics and Drawings Set</u>	Monitor Patient Vital Signs, 106EL w/spo2 Monitor Patient Vital Signs, 106EL
6515-01-432-2707 6515-01-432-2711 <u>Directions for Use</u> <u>Reference Guide</u> <u>Update</u>	Monitor Patient Vital Signs, 206EL w/spo2 Monitor Patient Vital Signs, 206EL w/spo2 and capnography
6515-01-434-1999 <u>Owners Manual</u>	Blood/Fluid Warmer & Infusion, System 1000 (Sims Level 1)
6515-01-435-5350 <u>Instruction Manual, Operation and Service</u>	Suction Apparatus Oropharyngeal, 325M
6515-01-464-0267 Operation and Service Manual	Ventilator Volume Portable, 754M Eagle
6520-00-181-7349 Installation and Repair Manual TM 8-6520-004-14&P	Dental Chair and Stool Unit, CM-185

(continued) APPENDIX B: CD 2 TABLE OF CONTENTS

6520-01-456-7170	Dental Unit, Self-Contained, ADU-10CF Operation and Maintenance Manual Service Manual and Parts List
	Portable Air Compressor, AA-75CF Operation and Maintenance Manual Service Manual and Parts List
6525-01-325-3740	X-ray Apparatus, Portable, 1200
6525-01-457-1536	<u>Operation and Maintenance Manual</u>
6525-01-345-6089	Processing Machine Radiographic, Curix 60 Operator's Installation and Instruction Manual
*6530-01-429-6715	Sink Unit Surgical Scrub, RPC 1000 <u>Operator's, Organizational, Maintenance Manual</u>
6540-00-181-8037	Lens Measuring Instrument Ophthalmic, 4001 <u>Instruction Handbook</u>
6540-01-032-4518	Light Slit Ophthalmic, Marco V <u>Instruction Manual</u>
*6540-01-145-8775	Chair Optometry, Portable <u>Technical Manual</u>
6540-01-241-6965	Slit Lamp, SL-6E Service Parts List TM 8-6540-002-14&P
6545-01-302-0228	Sink Unit, Surgical Scrub, Field <u>TM 8-6545-001-24&P</u>
6640-01-258-0006	Shaking Machine Laboratory, Vortex Genie 2 <u>Operating and Installation Guides</u>
6640-01-316-5084	Centrifuge, 708T Operation and Service Manual
6650-01-293-7240	Microscope Optical, Labophot
6650-01-325-3747	Microscope Optical, Labophot2 <u>Operation and Preventive Maintenance</u>
6650-01-406-1828	Microscope Optical, BX40F3 <u>Instructions</u>

*** For parts support call Medical Maintenance Support Division, Utah (commercial 801-586-4949/4950 or DSN 586-4949/4950, fax X5058).**

APPENDIX C: CD 3 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 3*

4110-01-117-3902	Refrigerator, Mechanical, Blood Bank, BBR37SS-1B-03
<u>TM 8-4110-001-24&P</u>	
<u>Commercial Operating Instruction Manual</u>	
<u>4110-01-249-4476</u>	<u>Refrigerator, Mechanical, Blood Bank, CT1-1B-06</u>
Commercial Operating Instruction Manual	
Commercial Maintenance Manual	
4110-01-287-7111	Solid State Refrigerator, DLA-50T
<u>TM 8-4110-002-14&P</u>	
<u>Operational Manual</u>	
<u>Maintenance Manual</u>	
<u>*4110-01-287-7111</u>	<u>Thermostabilizer for Blood, RCB42 P</u>
Service Manual	
<u>6515-01-174-1477</u>	<u>Suction and Pressure Apparatus, 317M</u>
Instruction Manual, Operation and Service	
6515-01-185-8446	Anesthesia Apparatus, 885A
<u>Instruction and Service Manual with Illustrated Parts List</u>	
<u>TM 8-6515-001-24&P</u>	
6515-01-242-9123	Suction Apparatus, 308M
6515-01-304-6497	
<u>TM 8-6515-004-24&P</u>	
<u>Instruction Manual, Operation and Service</u>	
6515-01-267-2726	Suction Apparatus, 306
6515-01-267-2727	
<u>TM 8-6515-013-14&P, 306M</u>	
<u>Instruction Manual, Operation & Service, 306 Series</u>	
<u>*6515-01-291-1198</u>	<u>Defibrillator/Monitor-Recorder, 43110MC, Operating Guide</u>
	<u>Defibrillator Module, 43130M, Service Manual</u>
<u>*6515-01-291-1199</u>	<u>Monitor-Recorder Module, 43200M/MC/MD, Service Manual</u>
6515-01-313-6242	Digital Thermometer, 600
<u>Directions for Use Manual</u>	
<u>Technical Manual</u>	
<u>TM 8-6515-012-14&P</u>	

(continued) APPENDIX C: CD 3 TABLE OF CONTENTS

6515-01-383-0922	Anesthesia Ventilator, 7000 <u>Service Manual</u> <u>Operation and Maintenance Manual</u>
6515-01-452-0625	<u>Infusion Pump, MedSystem III</u> Service Bulletins MedSystem III Directions for Use Technical Service Manual MedSystem III Infusion System
6520-00-000-0158	Dental Light Set, LF II <u>TM 8-6520-001-24&P</u> <u>Installation Instructions, Operating Instructions, Use and Care Manual</u> <u>Service Manual, Repair Manual, and Parts List Manual</u>
6520-00-139-1246	Dental Compressor-Dehydrator, M5B <u>TM 8-6520-003-24&P</u> <u>Technical Manual</u>
6520-00-139-1246 6520-01-398-4613	<u>Dental Compressor-Dehydrator, PAC 6.7</u> Technical Manual, Defiance Electronics Owners Manual/Parts List, HP Series, Piston Air Products HP Series, 1 & 1-1/2 Horsepower, Pneumotive Service Procedures
6520-00-140-7663 6520-01-272-4531	Dental Operating Unit, Porta-Cart 3406 <u>Operation and Maintenance Instructions</u> <u>TM 8-6520-002-24&P</u>
6520-00-966-3729	Electric Laboratory Dental Furnace <u>Instructions for the Operation and Maintenance</u>
6520-01-333-5961	Dental System, FUS336 <u>Operation and Maintenance Instructions</u>
6520-01-343-8126	Portable Field Dental Unit, 2100M <u>Operation and Maintenance Manual</u>
6520-01-446-3783	Portable Dental Chair, ADC-01CS <u>Operation and Maintenance Manual</u>
6525-01-303-6235	<u>X-ray Processor, AFP 14X-3</u>
6525-01-370-7552	<u>Portable Dental X-ray System, ALPHA MPDX</u> Operation Manual Maintenance Manual

(continued) APPENDIX C: CD 3 TABLE OF CONTENTS

<u>6525-01-422-6122</u>	<u>Processing Machine, Radiographic Film with Daylight Loader</u> Installation, Operation, Service, and Parts Manual
*6530-00-926-2151	Portable Sterilizer System, M-138
<u>Instructions</u> <u>TM 8-6530-004-24&P</u>	
<u>6530-01-244-0708</u>	<u>Field Hospital Surgical Light, 2420</u>
Service Manual	
6530-01-246-1906	Portable Intermittent Traction Machine, Tru-Trac TT-92B Series
<u>Operating Instructions</u> <u>Service Manual</u>	
6530-01-306-1771	Validator, 8" and 10"
<u>Operator's Manual</u> <u>Service Manual</u> <u>Parts List, 8"</u>	
<u>6530-01-308-7740</u>	<u>Sink Unit, 950S936</u> <u>Hamilton Installation Operation and Maintenance Manual</u>
6530-01-327-0686	Portable Ventilator, 750 and 750M
<u>TM 8-6530-009-24&P</u> <u>Instruction Manual, Operation & Service</u>	
<u>6530-01-374-8903</u>	<u>Portable Ventilator, Bird Avian</u>
Operator/Service Manual	
<u>6530-01-442-8720</u>	<u>Steam Sterilizer, MC 8 and MC 10</u> Service Manual GLS-8 and GLS-10
<u>6630-01-284-6546</u>	<u>Analog pH Meter, Orion Model 301</u> Commercial Maintenance and Operation Manual
<u>6630-01-300-8711</u>	<u>Analyzer, Sodium Potassium, 614</u>
Instruction Manual Service Manual	
6630-01-316-5085	Centrifugal Analyzer, QBC II
<u>Maintenance Manual for the QBC II Reader, Model 4477</u> <u>Operator's Manual For The QBC II Plus Centrifugal Hematology System and</u> <u>Maintenance Manual For The QBC Centrifuge, Model 4207</u>	
6630-01-364-8555	Portable Blood Gas Analyzer, GEM-STAT
<u>Comprehensive Service Manual</u> <u>Operator's Manual</u>	

(continued) APPENDIX C: CD 3 TABLE OF CONTENTS

<u>6640-01-034-0479</u> Instruction Manual	<u>Colony Counter, 3325, 3326, 3327, 3328</u>
<u>6640-01-143-2055</u> <u>TM 8-6640-001-24&P</u> <u>Operator's Manual</u>	SERO-FUGE and SERO-FUGE II Laboratory Centrifuge, 0521, 0522, 0541
<u>6640-01-283-9308</u> <u>6640-01-302-1025</u> <u>Operation/Instruction/Maintenance Manual</u>	<u>Viewer Agglutination</u> Oven, STG80
<u>6640-01-315-5382</u> <u>Instruction Manual</u> <u>Service Manual</u>	Laboratory Centrifuge, Z 320
<u>6650-00-973-6945</u> Instruction Manual	<u>StereoZoom Series Microscope</u>
<u>6650-01-259-3008</u> Maintenance Manual Instruction Manual	<u>Field Microscope, FM 600</u>

*** For parts support call Medical Maintenance Support Division, Utah (commercial 801-586-4949/4950 or DSN 586-4949/4950, fax X5058).**

APPENDIX D: CD 4 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 4*

4110-01-291-7046	Mechanical Field Ward Refrigerator <u>Operation and Maintenance Manual</u>
4110-01-320-1699	Redundant Refrigeration System, MBF-500 <u>Service Data Manual</u>
4110-01-358-3836	Refrigerator-Mechanical, Biological, ERB-5-0378 <u>Operation and Maintenance Manual</u>
4110-01-450-0060	<u>Blood Plasma Freezer, CTF1-1B-06</u> Service Manual Electronic Temperature Recorder Manual Monitor DTPM Series Installation and Operating Instructions Transformer & Recording Thermometer Installation, Operation and Service Manual
6515-01-150-7840	<u>Blood/Fluid Warmer, FLOTEM IIe</u> Operation Instruction Manual Technical Maintenance Manual
6515-01-241-7531	<u>Suction Apparatus (Uni-Suction Pump)</u> Description and Function Service Manual
6515-01-261-0484	Aspirator, RS-4, RS-6 & RS-5X <u>Operators Manual</u>
6515-01-293-5578	Doppler Ultrasound Instrument, D8 <u>Operator, Instruction and Service Manual</u>
6515-01-318-1558	Arthroscopic Surgical Unit, MIL-D-42048 <u>Maintenance Instructions</u>
6515-01-376-6564	Upper GI Fiberscopes, FG-24X, FG-27X, FG-29X, FG-32X, FG-34X <u>Owner's Manual</u>
6515-01-379-7852	Cutter-Vacuum, Orthopedic Cast, 940 <u>Maintenance/Operator's Manual</u>
6515-01-386-4354	Transcutaneous Electrical Nerve Stimulator, Maxima II <u>Operation Manual</u>

(continued) APPENDIX D: CD 4 TABLE OF CONTENTS

6525-01-312-6411	Continental X-ray, CS-8952
	<u>Operator's Manual 9023-401</u>
	<u>Volume I</u>
	<u>Volume II</u>
	<u>Shipping Retrofit Instructions, Manual 9023-407</u>
6525-01-369-7178	<u>Portable Darkroom X-ray, PDR-1</u>
	Technical Manual
	Operating Instructions and Service Manual
6525-01-384-9296	<u>X-ray Apparatus, Clinix VP4</u>
	System Operator's Guide
	System Installation Manual, Table/SynerGen
	Service Manual, X-ray Generator
	Installation Manual, Collimator
	Installation Manual, Table
	<u>Parts List for Clinix VP4</u>
	<u>Schematics 1 for Clinix VP4</u>
	<u>Schematics 2 for Clinix VP4</u>
6525-01-425-5216	Dental X-ray Apparatus, HDX
	<u>Installation, Operation & Maintenance Manual</u>
6525-01-468-1672	Portable Dental X-ray Unit, MinXray P200D Mark III
	<u>Installation and Operating Instructions</u>
6525-01-480-2199	<u>Medical Filmless Imaging System, (8 models)</u>
6530-01-127-2215	Whirlpool Bath, 290
6530-01-206-6016	
	<u>Maintenance Manual and Operating Instruction Manual</u>
6530-01-128-2442	<u>Whirlpool Bath</u>
	Mobile Hydrotherapy Unit – Operation, Service and Repair Parts Manual
	Electric Turbine Ejector – Operation, Service and Repair Parts Manual
	Electrical Converter – Operation and Maintenance Manual
6530-01-244-1976	<u>Solution Warming Cabinet – Two Compartment, 7924-SSDP</u>
6530-01-207-0827	
	Operator's Manual
	Maintenance Manual
6530-01-244-8101	<u>Medi-Therm Hyper/Hypothermia, MTA-4700/MTA-4701/MTA-4702</u>
	Service Manual
	Operating Instruction Manual
6530-01-254-4135	<u>Mobile Ultrasonic Cleaner, MSC-900T-11/21</u>
	Operating Instruction Manual
	Maintenance Manual

(continued) APPENDIX D: CD 4 TABLE OF CONTENTS

6530-01-306-9510	Sterilizer, Surgical Instrument and Dressing <u>Operator's Organizational Maintenance Manual</u>
6530-01-353-9883	<u>Surgical Tables</u> Maintenance Manual, 2080M and 2080M I.A. Equipment Manual, 2080IA
	Water Distribution and Waste Water Management System (WDWWMS) <u>Operator's and Organizational Maintenance Manual</u>
6545-01-435-6914	Water Distribution Set, Hospital, DEPMEDS
6545-01-434-9624	Wastewater Management Set, Hospital, DEPMEDS
6545-01-435-6013	Waste-Water Augmentation Set, Hospital, DEPMEDS
6545-01-480-6913	WDWWMS Maintenance Set, Hospital, DEPMEDS
6545-01-491-4732	Water Distribution Set, Hospital, MRI 84 Bed
6545-01-491-4728	Wastewater Management Set, Hospital, MRI 84 Bed
6545-01-491-4698	WDWWMS Maintenance Set, MRI 84 Bed
6630-01-344-9996	Plasma Coagulation Timing Instrument, Electra 750 <u>Service Manual</u>
6630-01-376-9823	Chemical Clinical Analyzer <u>Service Publication for the DT60 Analyzer and DTE Module</u> <u>Service Publication for the DTSC Module</u>
6640-00-765-0621	Water Bath, Imperial III <u>Instruction Manual</u>
6640-01-249-1212	Pipette Shaker, 0621010 <u>Technical Manual</u>
6640-01-291-8390	Hot Plate/Stirrer, 502 Series <u>Operating and Maintenance Manual</u>
6640-01-308-7749	Refrigerated Centrifuge, 3497 <u>Instruction Manual</u>

APPENDIX E: CD 5 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 5*

3540-00-457-2699 <u>Operator's Manual</u> <u>Service Manual</u>	Hematron Dielectric Sealer, 4R4330/4R4340
4110-00-837-6441 <u>Service & Parts Manual</u>	Ice-O-Matic, C Series Cuber
4110-01-422-6809 Operators Manual Service Manual Repair Parts and Support Kits Instruction Insert	<u>Blood Bank Refrigerator, Harris</u>
4110-01-504-1157 <u>Owner's Instructions</u>	Commercial Refrigerator, Refrigerator/Freezer & Freezer
6515-01-153-9649 6515-01-283-6221 <u>Owner's Manual</u> <u>TM 8-6515-006-24&P</u>	Fiber Optic Light Source, 52-1201
6515-01-246-1938 <u>Maintenance and Service Manual</u> <u>TM 8-6515-008-24&P</u>	Suction Apparatus, 6003
6515-01-259-4307 <u>Operation, Maintenance, and Service Manual</u> <u>TM 8-6515-009-24&P</u>	Suction Apparatus, GOMCO 6053
6515-01-269-6056 <u>Operating & Service Manual</u>	Electrosurgery Unit, 774
6515-01-285-4617 <u>TM 8-6515-005-24&P</u>	Fiberoptic Bronchoscope, F3 and F3G
6515-01-293-5577 <u>Operator's Manual</u> <u>Service Manual</u>	Pulse Oximeter, 3040G
6515-01-318-1558 <u>TM 8-6515-010-14&P</u>	Arthroscopic Surgical Unit

(continued) APPENDIX E: CD 5 TABLE OF CONTENTS

6515-01-327-4155	Endoscopic Instrument Light, DLMP-300 <u>Operation & Maintenance Manual</u> <u>TM 8-6515-007-24&P</u>
6515-01-358-9480	Thermal Drainage Unit, 2590-120G <u>Instructions for Operation and Maintenance</u>
6515-01-397-5212	MiniStim Peripheral Nerve Stimulator, MS-II <u>Instruction Manual</u>
6515-01-432-2707	Monitor Patient Vital Signs, 206EL w/spo2
6515-01-432-2711	Monitor Patient Vital Signs, 206EL w/spo2 and capnography <u>Update and Service Manual</u> <u>Directions for Use</u> <u>Reference Guide</u> <u>Update</u>
6515-01-446-6766	Oximeter, BCI 3303 <u>Clinician's Operation Manual</u> <u>Service Manual</u>
6515-01-457-1840	Anesthesia System, Narkomed M <u>Technical Service Manual</u>
6515-01-466-0971	Finger Pulse Oximeter <u>Instruction and Service Manual</u>
6520-01-345-6089	<u>Table Top Processor, Curix 60</u> Operator's Installation and Instruction Manual Technical Documentation
6525-01-496-4229	Ultrasound System PLUS, Sonosite <u>Service Manual</u>
6525-01-504-5002	Scanner, PcCR1417 (Automatic Cassette Loading Version) <u>Interface Guide, Version 2.5.1.09</u> <u>ACL4 System Installation Manual</u> <u>ACL4 System User Manual</u> <u>ACL4 System Service Manual</u>
6530-00-709-8175	Field Operating Table <u>TM 8-6530-011-14&P</u>

(continued) APPENDIX E: CD 5 TABLE OF CONTENTS

6530-01-254-4135	Mobile Ultrasonic Cleaner
<u>TM 8-6530-005-24&P</u>	
<u>6530-01-269-1802</u>	<u>Warming Cabinets, 5540, 5545, 5550</u>
Service Manual	
Operator Manual	
Installation Instructions	
Parts Catalog	
<u>Service Manual, Revision C, 5520, 5525, 5530</u>	
<u>TM 8-6530-007-24&P, Model 5520</u>	
<u>TM 8-6530-008-24&P, Model 5550</u>	
<u>6530-01-321-5592</u>	<u>Field Operating Table with ARC</u>
Field Operating Table Assembly and Packing Instructions	
ARC Instruction Manual	
6530-01-343-2033	Surgical Field Light, 2410MB
<u>Operator Manual</u>	
<u>TM 8-6530-010-24&P</u>	
<u>6630-01-247-1331</u>	<u>Digiclot II Coagulation Timer, 820</u>
Operator's Manual	
Operator Instructions	
Service Manual	
Parts Lists	
Schematics	
820 Procedure Summary	
6630-01-300-8711	Analyzer, ISE Na ⁺ /K ⁺ , 614
<u>Operator's Guide</u>	
<u>Instruction Manual</u>	
<u>Service Manual</u>	
6640-01-416-7345	Centrifuge, SERO-FUGE 2000 Series
<u>Operator's Manual</u>	
Multiple NSNs	Water Distribution and Waste Water Management System
<u>Operator's and Organization Maintenance Manual</u>	
N/A	Maintenance Expenditure Limits for Medical Materiel
<u>TB MED 7</u>	
N/A	Operating Guide for Medical Equipment Maintenance
<u>TB MED 750-1</u>	
N/A	SB 8-75-11
<u>AR 40-61 (Medical Logistics Policies and Procedures) Augmentation</u>	

(continued) APPENDIX E: CD 5 TABLE OF CONTENTS

<u>N/A</u>	<u>Dexis Digital X-ray System</u> User's Manual System Requirements Installing DICOM Conformance Statement
N/A	Portable Oxygen Generation System, POGS 33 <u>Maintenance Manual</u> <u>Operations Manual</u>

APPENDIX F: CD 6 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 6*

6515-01-104-0396	Light Source, MILS-1 <u>Operation and Maintenance Manual</u>
6515-01-287-0607	Tourniquet System, A.T.S. 1500 <u>Operator & Service Manual</u>
6515-01-290-8949	Ancillary Coaxial System <u>Instruction Manual</u>
6515-01-335-9383	<u>Surgical Microscope, Wild M650/M690</u> Training Manual Service Manual Spare Parts Manual Instructions for Use
6515-01-342-9195	Vital Signs Measurement System (Thermometer), 2080 <u>Service Manual</u>
6515-01-378-4529	Ultrasound Stimulator, Intellect Model 700-C <u>Operator's and Service Manual</u>
6515-01-397-5257	Surgical Operating Microscope, Wild M690 <u>Spare Parts Catalog</u>
6515-01-435-0050	Surgical Suction Apparatus, Gastrointestinal Abdominal Drainage, 326M <u>Operation & Service</u>
6515-01-457-1840	<u>Narkomed M Anesthesia System, Part No. 4114179</u> Operator's Instruction and Setup Manual Drager-Vapor 2000 Anesthetic Vaporizer Instructions for Use <u>Technical Service Manual</u>
6515-01-503-3369	Pulse Oximeter, PalmSAT 2500 <u>Operator's Manual</u>
6520-01-045-6407	Ultrasonic Dental Unit with Automatic Fine Tuning, 2001 <u>Installation and Service Manual</u>
6525-01-099-2320	Portaray Heliodont 70 with Dentotime, D3152 <u>Maintenance Instructions</u>

(continued) APPENDIX F: CD 6 TABLE OF CONTENTS

6525-01-268-5152	CURIX ID Camera, 8400/300/340/350
<u>Technical Documentation</u>	
6525-01-503-7170	Ultrasound System, C1.99 PLUS and ELITE
<u>Service Manual</u>	
<u>User Guide</u>	
6530-00-709-8175	Field Operating Table
<u>Service Data</u>	
<u>Service Manual</u>	
<u>TM 8-6530-011-14&P</u>	
6530-01-292-7700	Ultraviolet Hand Lamp, Spectroline EN 140L - BV
<u>Operator's Manual</u>	
6530-01-330-7455	Water Recovery System (Use with Sterilizer NSN 6530-00-926-2151)
<u>Draft Technical Manual - Operator's Manual</u>	
6530-01-459-4569	COLPAC Master Chilling Units, C-2, C-5, C-6
<u>Instructions for Use and Operation</u>	
6540-01-340-0844	<u>Eye Magnet, Series 10K</u>
Operation Instruction Manual	
Maintenance Instruction Manual	
6545-01-284-3035	Cystoscopic Kit, MILGUDI-1
<u>Operation and Maintenance Manual</u>	
6640-01-246-1989	Serological Water Bath, 148007
<u>Instruction and Maintenance Manual</u>	
6640-01-271-4094	Dry Heat Incubator, 110444
<u>Instruction and Maintenance Manual</u>	
6640-01-308-7749	Refrigerated Centrifuge, 3497
<u>Instruction Manual</u>	
6640-01-315-5382	Laboratory Centrifuge, Z320
<u>Instruction Manual</u>	
<u>Service Manual</u>	
6640-01-416-1385	<u>Flo-Thru CO2 Incubators, 325GVT, 325-1GVT</u>
Service Manual	
Service and Operating/Instruction Manual	

(continued) APPENDIX F: CD 6 TABLE OF CONTENTS

6640-01-463-0068	Automated Microbiological Panel Reader, AutoSCAN - 4
<u>Service Manual</u>	
6650-01-293-7240	Microscope Labophot
6650-01-325-3747	Microscope Labophot2
<u>Operation and Preventive Maintenance</u>	
6650-01-406-1828	Microscope, BX40 System
<u>Service Manual</u>	
6695-01-255-2855	Calibration Analyzer, RT-200
<u>Operation/Service Manual</u>	
N/A	Defibrillator Analyzer, QED-III
<u>Operator's Manual</u>	
N/A	Portable Dental X-ray Unit, MinXray P200D Mark III
<u>Installation and Operating Instructions</u>	
N/A	Power Instrumentation for Small Bone Surgery
<u>Instruction Manual</u>	

APPENDIX G: CD 7 TABLE OF CONTENTS

Operator & Maintenance Literature for Medical Equipment *Disc 7*

6515-01-327-6798	Oxygen Concentrator, Model NewLife
6515-01-434-4629	
	New Life® Elite Oxygen Concentrator Patient Manual
	New Life® Elite Oxygen Concentrator Service Manual
	New Life® Oxygen Concentrator Service Manual
	New Life® Oxygen Concentrator Patient Manual
6515-01-429-1381	Defibrillator/Monitor/Pacemaker, Model Lifepak 10
6515-01-453-4003	
	Operating Instructions
	Service Manual
6515-01-452-0625	Multi-Channel Infusion Pump, Model MedSystem III
6515-01-486-4310	
	Directions for Use
	Directions for Use with Drug List Editor
	Technical Service Manual
6515-01-513-0989	Life Support for Trauma and Transport (LSTAT), Model 9602B
	User Manual
6515-01-515-4197	ZOLL Defibrillator Monitor Recorder, Model M Series
	Operator's Guide
	Operator's Guide – Manual Insert
	Service Manual
	Configuration Guide
	12-Lead ECG Monitoring
	Non-Interpretive 12-Lead ECG Monitoring
	Base PowerCharger ^{4x4} Operator's Manual
	Base PowerCharger ^{4x4} Service Manual
	Base PowerCharger ^{4x4} Service Manual Insert
	Base PowerCharger ^{1x1} Operator's Manual
	Base PowerCharger ^{1x1} Service Manual
	End-Tidal Carbon Dioxide (EtCO₂)
	Invasive Blood Pressure
	Invasive Blood Pressure Service Manual

(continued) APPENDIX G: CD 7 TABLE OF CONTENTS

	<u>Non-Invasive Blood Pressure</u>
	<u>Non-Invasive Blood Pressure Service Manual</u>
	<u>Temperature</u>
	<u>Temperature Service Manual</u>
	<u>Critical Care Transport (CCT) Service Manual</u>
	<u>CCT Insert</u>
	<u>Military Airworthiness-Certified CCT Manual Insert</u>
	<u>Military Airworthiness-Certified CCT Service Manual Insert</u>
	<u>XL Battery</u>
	<u>Pulse Oximetry (SpO₂)</u>
	<u>Rectilinear Biphasic Waveform Defibrillator Option</u>
6520-01-313-6250	Dentsply®/Cavatron®, Ultrasonic Dental Unit, Model 3000™
	<u>Installation and Service Manual</u>
6520-01-493-3759	Dental Field Treatment and Operating System, Model PortaBELL II
	<u>Operating and Maintenance Manual</u>
6525-01-505-7780	Dental X-Ray Apparatus, Model DEXIS®
	<u>User's Manual</u>
	<u>Installing Dexis on a Network</u>
	<u>DICOM Conformance Statement 2.0</u>
6525-01-514-9962	Radiographic X-Ray Apparatus, Model BuckyDiagnostic
	<u>BuckyDiagnostic Bucky Unit Instructions for Use</u>
	<u>BuckyDiagnostic VE/VT Wall Bucky Instructions for Use</u>
	<u>BuckyDiagnostic FS Movable Floor Stands Instructions for Use</u>
	<u>BuckyDiagnostic TH2/TF Patient Tables Instructions for Use</u>
	<u>Measuring Chambers 8 mm Filing Instructions</u>
	<u>BuckyDiagnostic Floor System – System Manual Installation</u>
	<u>BuckyDiagnostic Floor System – System Reference Installation</u>
	<u>System BuckyDiagnostic FS – Subsystem Manual</u>
	<u>SMCM BuckyDiagnostic – Adjustment Instruction INALFA</u>
	<u>System BuckyDiagnostic TH2/TF– Subsystem Manual</u>
	<u>System BuckyDiagnostic Ceiling System– BuckyDiagnostic VE/VT V2 with ACL 4</u>
	<u>Bucky Unit INALFA</u>
	<u>NICOL X-Ray Beam Limiting Device</u>
	<u>Simplified Diagram Power Supplies</u>
	<u>Simplified Diagram X-Ray Beam Limiting Device</u>
	<u>Wiring Diagram X-Ray Beam Limiting Device</u>
	<u>Service Reference Sheet System Backpanel</u>

(continued) APPENDIX G: CD 7 TABLE OF CONTENTS

[Service Reference Sheet Power Supply](#)
[Service Reference Sheet Shutter/Iris/Filter](#)
[Service Reference Sheet Ruler Controller](#)
[Converter Test Kit OPTIMUS for 50/65/80 Generators](#)
[Converter R/F](#)
[X-Ray Generation – Subsystem Manual OPTIMUS RAD](#)
[Replacement of PCB C300](#)

6525-01-523-1989	MinXray Radiographic X-Ray Apparatus, Model HF120/60 HPPWV Power Plus
	HF120/60HPPWV Power Plus™ Service Manual HF120/60HPPWV Power Plus™ High Frequency Portable X-ray Unit Installation and Operating Instruction HF120/60HPPWV Power Plus™ Preliminary Technique Chart High Burst™ Electronic Design – Perfect for Digital Imaging Manually Operated X-Ray Collimator Model R-72/32-A
6545-01-507-2140	Water Distribution and Wastewater Management System (WDWWMS)
6545-01-507-7170	6545-01-434-9624
6545-01-435-6013	6545-01-480-6913
6545-01-491-4732	6545-01-491-4728
6545-01-491-4698	6545-01-502-4969
6545-01-502-4992	6545-01-502-4991
	Operations and Maintenance Manual
6625-01-192-9460	Battery Support System (for Lifepak Systems)
	Service Manual
6640-01-258-0006	Shaking Machine Lab, Model Vortex-Genie 2®
	Operating Instructions Vial Attachment 0A-0570-010

APPENDIX H. REFRIGERATOR, BLOOD, 4110-01-506-0895, PMCS PROCEDURES

1. The following is a list of TMDE required for the complete PMCS of the ACUTEMP model: HMC-MIL-1 Blood Refrigerator unit.

TMDE ITEM REQUIRED	TMDE ITEM USED
Digital Thermometer	
Safety Analyzer	
Computer (for data log downloads)	

2. This item requires a DA Label 2163 (CVC) with a Frequency of "A" and code of "I".

Note: When unit is in storage, every attempt should be made to ensure the batteries are charged IAW the manufacturer's recommendations.

3. PMCS Checklist

a. Visual checks

- (1) Check for NSN label. The item may or may not have a label on the side.
- (2) Check for external/internal damage.
- (3) Verify that all accessories are available.
 - (a) Stainless Steel blood bag baskets: one set of 10 each (check for sharp burs on the basket and shave as necessary).
 - (b) 40 amp hour battery set, two 20-amp hour batteries: set of 2 each
 - (c) AC power cord
 - (d) DC power cord
 - (e) Operation and Maintenance manuals (hard copy 1 each)
 - (f) Service and Repair manual (hard copy 1 each)
 - (g) Operation and Service Manual on CD (1 each)
 - (h) Service and Repair manual on CD (1 each)
 - (i) Hemalog software CD (1 each)
 - (j) Sponge (1 each)
 - (k) Screwdriver (1 each)
 - (l) Replacement filters (10 each)
- (4) Inspect unit's LCD display which should be centered in the window.
- (5) Inspect unit's LED display, it should be clearly visible without any obstructions. The manufacturer and USAMMA have determined that visibility of $\frac{3}{4}$ of the circle on the LED is the minimum acceptable. It was agreed that the items will be no less than $\frac{3}{4}$ of the LED circular area.
- (6) Inspect unit for missing internal blood baskets.
- (7) Inspect unit's exterior for missing hardware such as missing vents or filters.
- (8) Inspect unit's latches and verify they are able to close. **CAUTION: Some are too far away from each other which will cause excessive strain on the plastic components of the refrigerator.**
- (9) Inspect Lithium battery cover holder for broken clips. **CAUTION: These clips enable the cover to latch to the holder itself and are susceptible to breaking.**

- (10) Inspect unit's serial number at power up on the displayed LCD screen.
- (11) Inspect the cooling fan is blowing on the side of the unit.
- (12) Inspect inner tub/payload of unit for any irregular appearance of the plastic liner.
- (13) Inspect the battery percentage is 100% after 24 hours of continuous charge.
- (14) Inspect the LCD display for any error coded on the screen relating to the battery. (NOTE: A zero value listed on the data log in the battery charge section along with an error code on the LCD means the control board needs replacement.)
- (15) Check Service Mode: With the lid closed, press and hold **"MODE"** for 3 to 5 sec. Press **"DISPLAY"** once. Verify that the top right of the screen displays **"K:_____L"**. When the lid is opened, the **"L"** will no longer be displayed, only the **"K:_____"**. This verifies that the magnets on the lid are getting read by the unit.

b. Verify firmware version procedure

(1) Operational enhancements to the HemaCool 5 firmware were last made on 19 May 2005. There were adjustments made to the control algorithms which allow the units to maintain COOL and FREEZE set point temperatures under more extreme conditions. Units with firmware dates prior to 19 May 2005, although not necessary for proper operation, should be considered for firmware upgrades that may potentially improve their already noteworthy performance.

(2) An additional change that was implemented in the 19 May 2005 firmware is the elimination of the annoying audible alarm that is emitted when the HemaCool is first conditioned. This means that when the HemaCool is first changed from IDLE to either COOL or FREEZE, the alarm will not sound until after the unit has achieved the set point.

(3) Not all HemaCool 5's are capable of running the updated firmware. To verify your unit has the latest firmware revision or is able to be upgraded, do the following:

(a) Verify your unit has a serial number 5000 or greater. The firmware upgrade is only applicable to serial numbers 5000 and greater.

(b) Plug the unit into an AC outlet and leave in IDLE mode.

(c) Depress and hold MODE key for 3-4 seconds until the display page changes to a diagnostic screen, then release.

(d) Depress and release center DISPLAY button to page to the next screen.

(e) The date at the top left hand of the screen is your firmware release date. If it displays a date prior to 19 May 05, one should consider having the unit's firmware upgraded.

(4) With the latest version (19 May 05) of the HemaLog software loaded on PC and connected to the unit with a standard serial cable, upgrading the firmware of the HemaCool is a simple 2 click process. Follow the instructions described on page 1-32 of the HemaCool Operating Instruction Manual. Contact AcuTemp Technical Support if you need the latest version of the firmware or need any assistance.

c. Performance checks.

Follow Manufacturer's Recommended Checkout Procedures

(continued) APPENDIX H. REFRIGERATOR, BLOOD, 4110-01-506-0895 PMCS PROCEDURES

d. Cleaning

- (1) **CABINET.** Clean the exterior with mild soap and water. Never use abrasive scouring powders.
- (2) **INTERIOR AND DOOR.** Wash interior compartment and door gasket with soap and water. Mix 2 tablespoons of baking soda (if available) with one quart of warm water. Do not use an abrasive powder, solvent, polish cleaner or undiluted detergent.
- (3) **STAINLESS STEEL TOP.** Clean all stainless steel components of the sink using a stainless steel cleaner.

e. Packaging

- (1) Pour about a pint or so of antifreeze into the pump housing and ensure there are no leaks from the sink.
- (2) Pack the accessories.
- (3) Wrap the sink with bubble wrap or
- (4) Band the top and bottom horizontally along the folding lips of the box.

f. Tips for the Medical Equipment Repairer;

- (1) Perform visual inspection on unit to be tested for discrepancies related to assembly.
- (2) Read the log on the unit to determine the cycle intervals to be within the specified 4 hours tolerance at normal ambient temperatures. Battery voltages should never fall below 12.0 VDC, if it does, replace immediately. Important to input the proper date and serial number as well as time on the initial power up of the unit because this will be useful on the units data log.
- (3) Thermistor of the Unit's payload, responsible for the displayed temperature reading, is located inside the payload chamber bottom center, secured by a zip tie. Give the test equipment ample time to stabilize.
- (4) If unit does not power up with AC power verified by a non-working power supply led, replace board.
- (5) If unit is not within tolerance, board replacement is required or the unit needs to be sent to the OEM as of this time for insulation replacement repair is required and is only performed at the manufacturer's level at this time.
- (6) Upon review of the units data log, if there are missing information anomalies in the processors communication between the compressor and the CPU, separate the unit in question and tag with the appropriate tag to prevent unintended use. Example: missing codes stated on number 7 of this write up.

(7) Status codes on equipment data log:

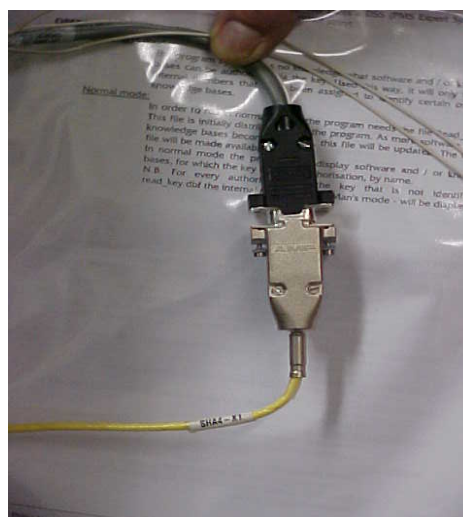
Y/N	On/Off
L/F	Cool/Freeze
C	Compressor On
H	Heater On (Unit Goes On Cool Mode From Freeze By Activating Heater)
O	Lid Open

For additional information, contact ACUTEMP, 7610 McEwen Road, Dayton, OH 45459; phone: 937-312-0114, FAX: x-1277, www.acutemp.com or www.support@acutemp.com.

APPENDIX I: INVASIVE MONITORING INSTRUCTIONS

There is an internal closed-loop monitoring circuit for mA that compares the actual mA with the set mA. If there is a difference, the system adjusts itself. However, the capability exists to read mA invasively. Procedures to follow are:

1. Remove front and left side panels
2. Remove cable SHA4-X1 from board SHA4
3. Install "test cable" in series with serial plug MAMEAS and cable SHA4-X1
4. Insert banana plugs into DC volt meter
5. Make x-ray and capture reading volts DC
6. $VDC = 3 \text{ times mA actual (i.e., } 4.5VDC = 1.5mA)$



APPENDIX J. EXTERNAL O₂ REGULATOR VERIFICATION

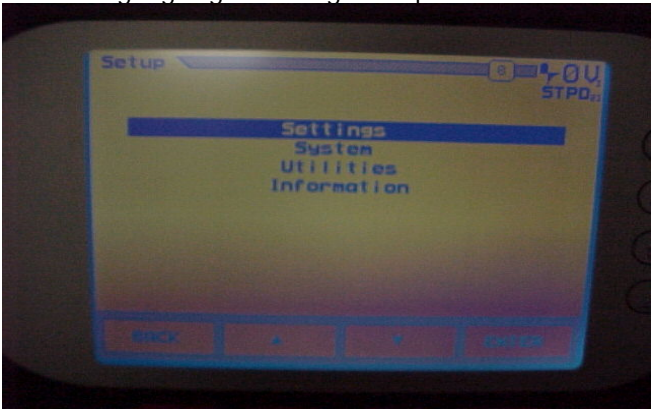
Install External O₂ Regulator to H or K size Oxygen cylinder.
Make sure cylinder has 250 - 3000 psi.



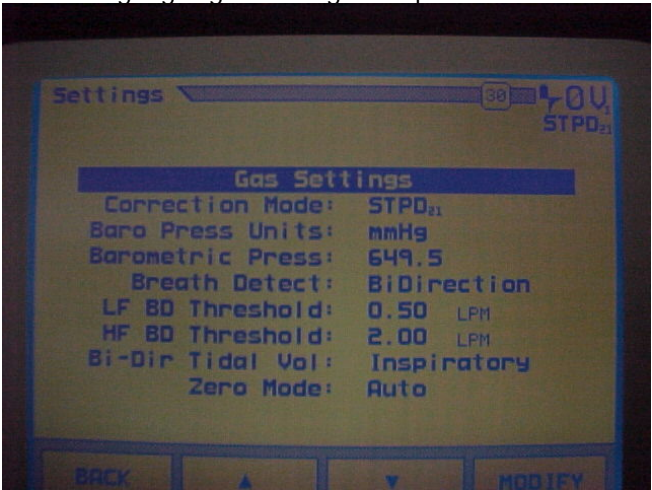
Install one end of Oxygen hose to the O₂ regulator output connector.
Setup VT Plus to read oxygen pressure.
Power up and let it zero after 5 minutes.
Press the pressure test mode button.
Press the setup button.
Highlight settings and press enter.



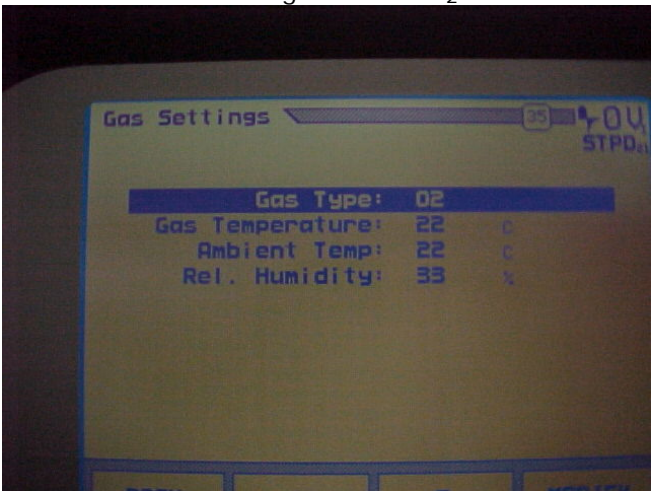
Highlight gas settings and press enter.



Highlight gas settings and press enter.



Set the gas to read O₂.



Press back until in the pressure test mode again.

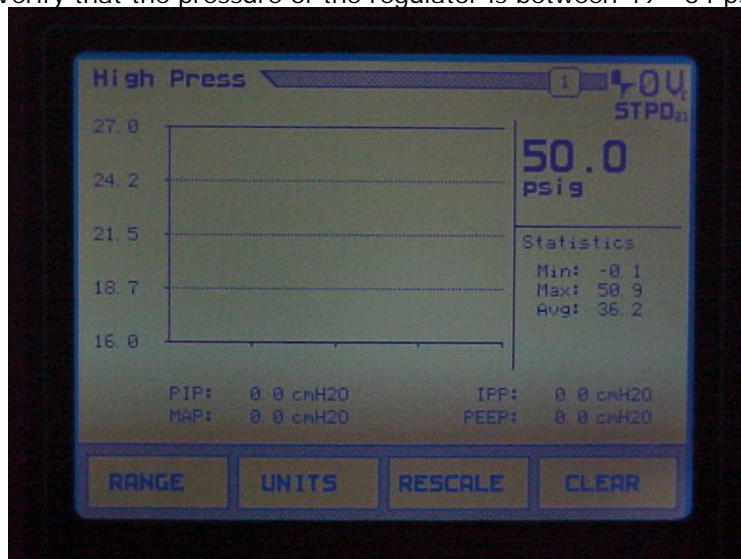
(continued) APPENDIX J. EXTERNA O₂ REGULATOR VERIFICATION

Install the other end of the oxygen hose to the positive pressure connection of the VT Plus.



Open the oxygen (H or K) cylinder.

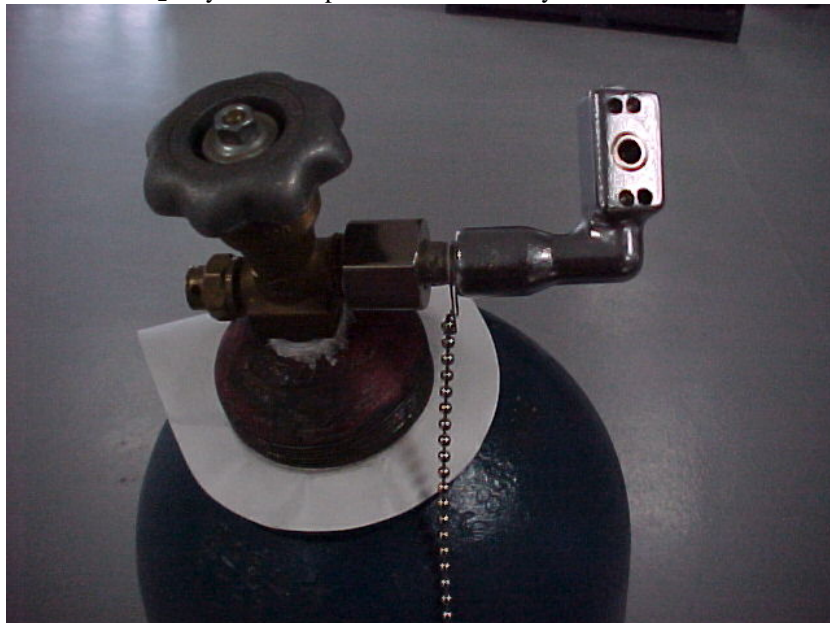
Verify that the pressure of the regulator is between 49 - 54 psi.



Disconnect the oxygen hose from the O₂ regulator.
Disconnect the O₂ regulator from the oxygen cylinder.

APPENDIX K. EXTERNAL N₂O REGULATOR VERIFICATION

Connect N₂O cylinder adapter to H or K size cylinder of nitrous oxide.



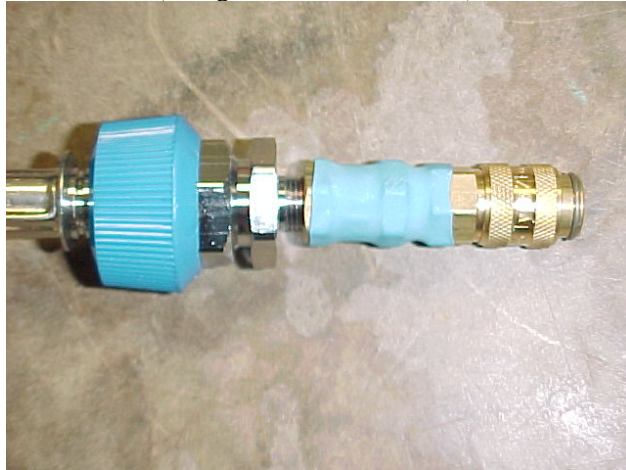
Connect external N₂O regulator to N₂O cylinder adapter.



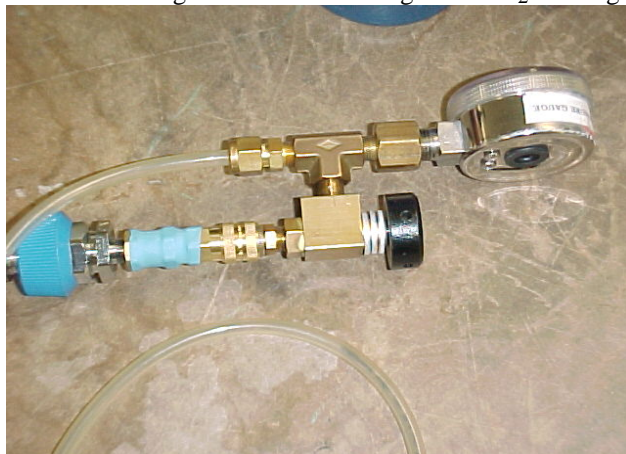
Connect one end of a blue N₂O hose to the regulator output connector.



Connect the other end of the blue N₂O hose to the N₂O fitting from the Narkomed Kit Part # 4114807 (fitting with male connection).

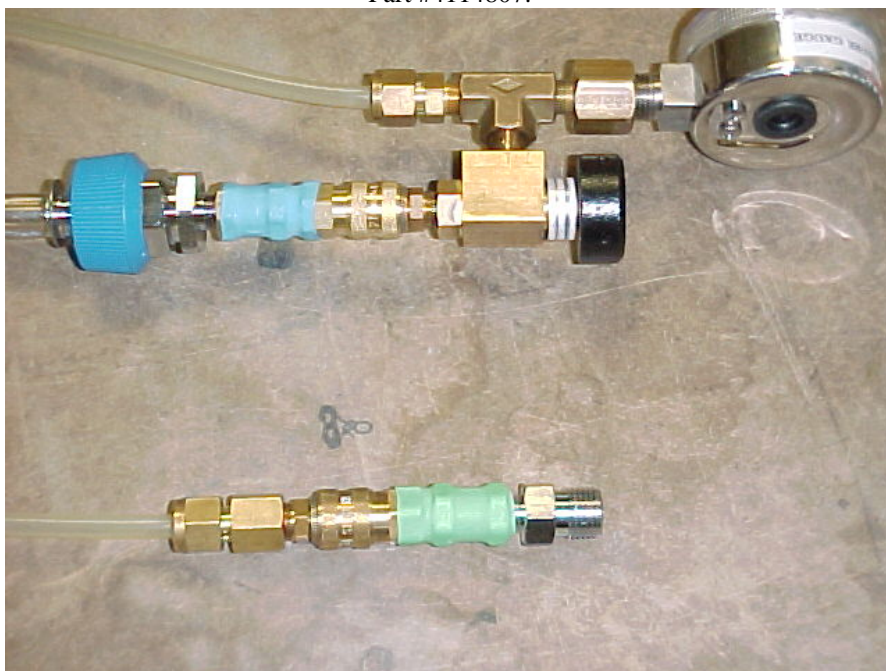


Connect the High Pressure Test Gauge to the N₂O fitting.

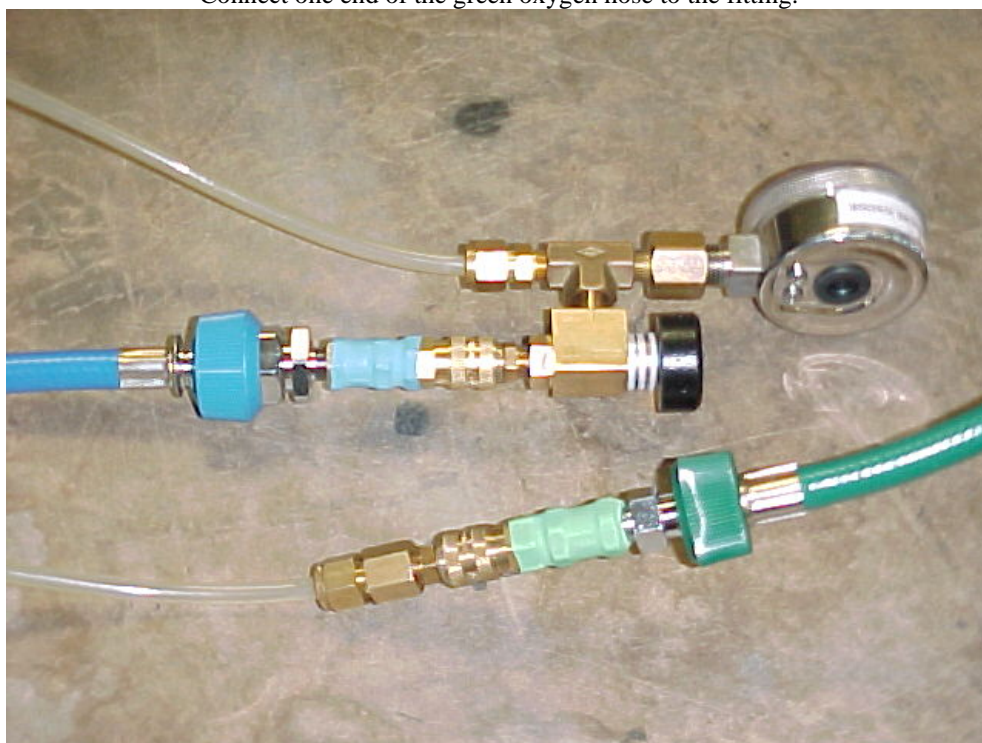


(continued) APPENDIX K. EXTERNAL N₂O REGULATOR VERIFICATION

Connect the hose of the High Pressure Test Gauge to male oxygen fitting from the Narkomed Kit Part #4114807.

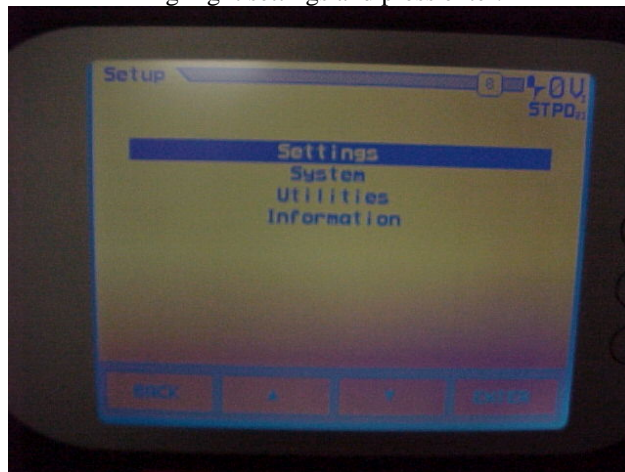


Connect one end of the green oxygen hose to the fitting.

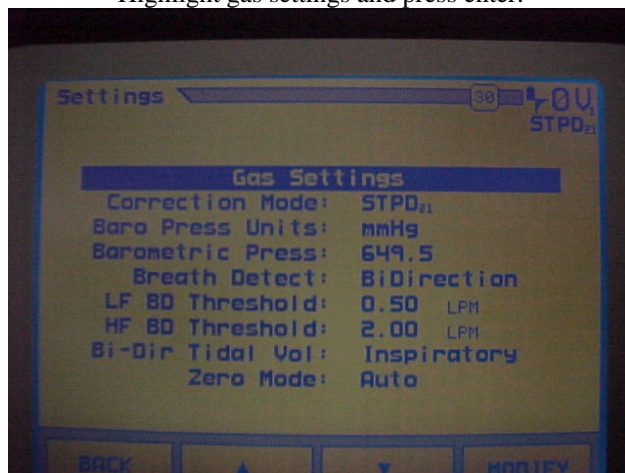


Setup the VT Plus to read N₂O.
Power up and let it zero after 5 minutes.
Press the pressure test mode button.

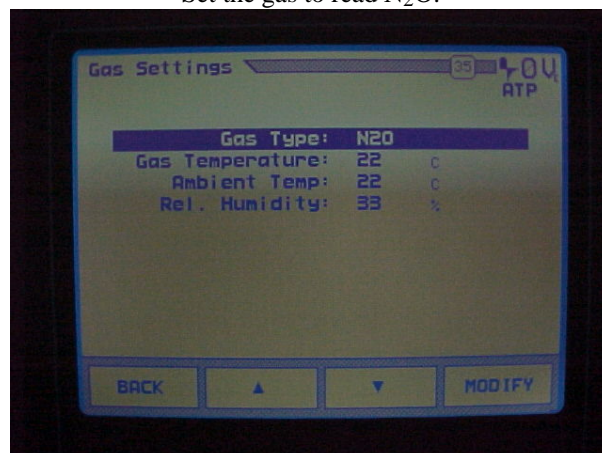
Press the setup button.
Highlight settings and press enter.



Highlight gas settings and press enter.



Set the gas to read N₂O.



Press back until in the pressure test mode again.

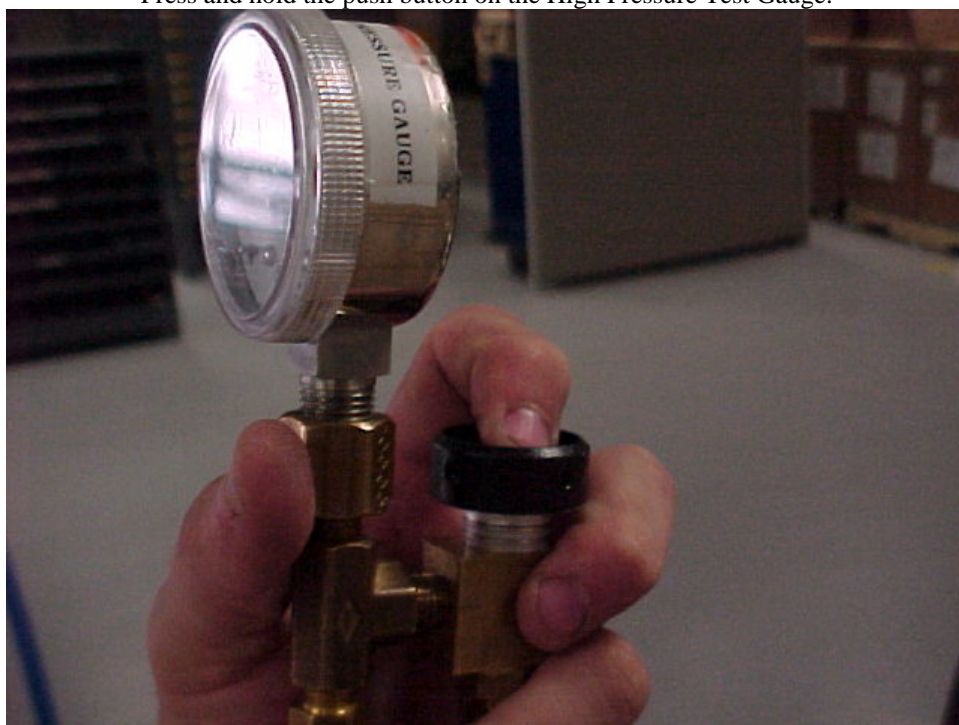
(continued) APPENDIX K. EXTERNAL N₂O REGULATOR VERIFICATION

Connect the other end of the oxygen hose to the positive pressure connection of the VT Plus.

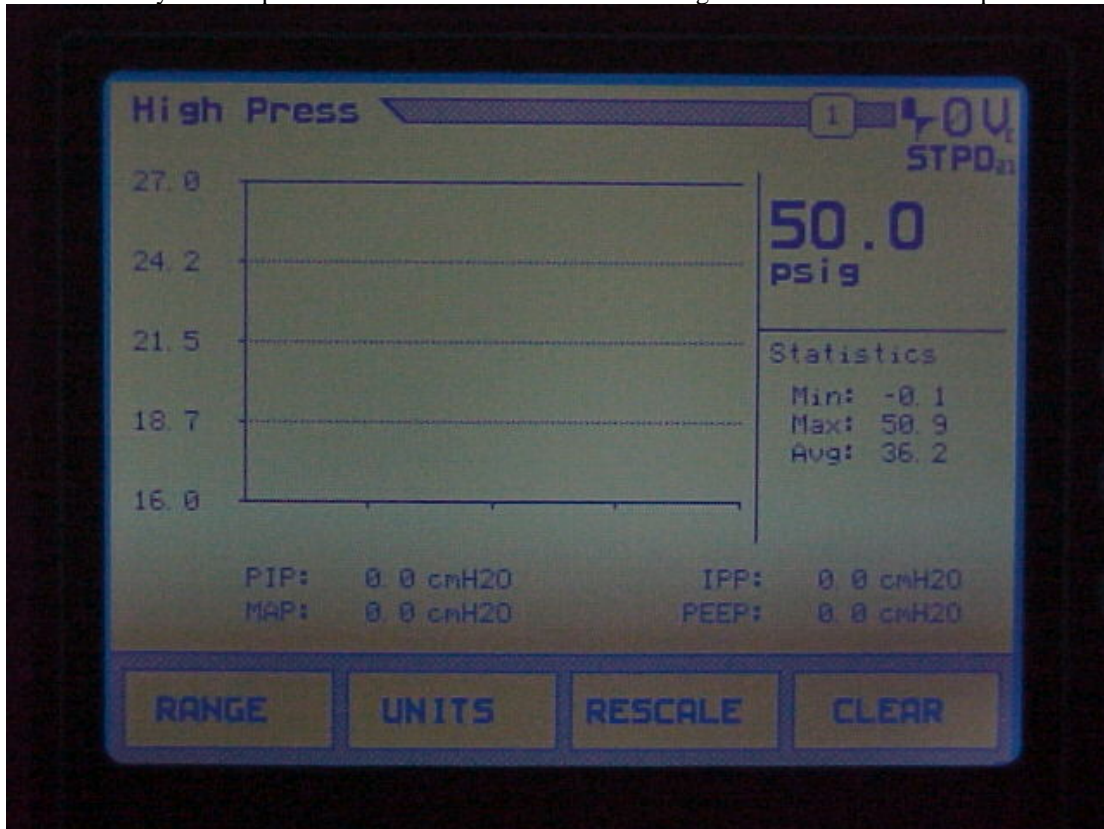


Open the N₂O (H or K) cylinder.

Press and hold the push button on the High Pressure Test Gauge.



Verify that the pressure read on the VT Plus from the regulator is between 49 - 54 psi.



Disconnect all fittings, hoses, and components of this test and return to proper location.

APPENDIX L. USE OF HEPA FILTER WITH IMPACT 754M VENTILATOR

This Appendix to SB 8-75-S2 is regarding the failure of the IMPACT 754M portable ventilator during use of the internal compressor. Operating the ventilator in a dirty or contaminated environment may hinder the performance of the internal compressor leading to premature failure. IMPACT Instrumentation, Inc., has a HEPA filter that can be used to alleviate or remedy this situation. Portions of information used in the following paragraphs are consistent with information provided by the Centers of Disease Control, www.cdc.gov.

1. HEPA filters are regarded as the best form of air filtration devices available today. HEPA stands for High-Efficiency Particulate Arrestance. According to U.S. Military Standard MIL-STD-282, HEPA filters are defined as air-cleaning devices that have a proven minimum removal efficiency of 99.97% of particles in the air equal to 0.3 μm (microns) in diameter with higher efficiency for both larger and smaller particle sizes. The reason 0.3 microns is used in the definition is because it's the particle size in which all mechanical filters are LEAST efficient in capturing and removing from the air. A micron is a measure of length: 1 micron equals 1 millionth of a meter. A particle size of 10 microns or less is not visible to the naked eye.

2. The Uni-Vent® Eagle™ Model 754 comes equipped with an internal compressor. The compressor is a mechanical component that generates air pressure for ventilation. Pressure is needed to deliver a volume of gas to the patient. In order for the compressor to operate, it needs to entrain air from the atmosphere. The Eagle's™ air entrainment port does not come with a HEPA filter installed. When the ventilator is operated in a clean environment like a hospital, a HEPA filter covering the air-entrainment port is generally not needed. It is highly recommended that when the ventilator is operated in environments where it is exposed to higher than normal levels of airborne contaminants that a HEPA filter be installed. The HEPA filter will help protect the inside of the ventilator from contamination and prolong the life of the internal components by preventing the build up of foreign matter like dust and dirt.

3. Use of a HEPA filter will also help protect the patient's airway from exposure to this foreign particulate matter. Undesirable contaminants that the HEPA filter will help block include: smoke, mold, hair, dust, dirt, pet dander, bacteria, viruses, and fungi. Please note that "HEPA-Type" filters may look like a certified HEPA filter; however, their performance may not match that of a true HEPA filter. No filter, including a true HEPA filter, can trap 100% of all contaminants. However, in terms of efficiency and performance, HEPA filters are the highest performing air filtration devices currently available. HEPA filters should ALWAYS be used in situations where the ventilator must be operated in contaminated environments. Two additional features of HEPA filters that add to their value is that unless the air entering the filter is humidified, bacteria and viruses that are trapped in the filter will dry out and die. The second feature is that the filter becomes more efficient over time because as the filter gets filled with trapped particles, it becomes more difficult for matter to pass through the filter. Depending on use and level of contaminate exposure, HEPA filters, like a regular filter need to be changed based on the manufacturer's recommendation.

2007 INDEX FOR DA SB 8-75-S2

<u>Paragraph Subject</u>	<u>SB 8-75-</u>	<u>Page</u>
Abaxis Clinical Chemistry Analyzer, Model Piccolo, 6630-01-415-1593	S2	1-1
Airsep Oxygen Concentrator, NSN 6515-01-434-4629	S2	1-1
Arthroscopic System, NSN 6515-01-431-9631	S2	1-1
Available On CD – Operator and Maintenance Literature	S2	1-2
Belmont Blood Fluid Warmer, Model FMS 2000, NSN 6515-01-465-2059	S2	1-2
Computed Radiography, NSN 6525-01-504-5002	S2	1-2
Defense Reutilization and Marketing Service (DRMS)	S2	1-3
DEFTOS Dental Operating Unit, Field, NSN 6520-01-493-3759	S2	1-3
Dynamics Intravenous Infusion Pump, NSN 6515-01-498-2252	S2	1-4
Equipment Items Support and Consumables Handbooks	S2	1-4
HemaCool Blood Refrigerator, NSN 4110-01-506-0895	S2	1-5
IMPACT Instrumentation, Inc., Ventilator, Model 754, NSN 6530-01-464-0267	S2	1-6
Invasive Monitoring of mA for the Philips BV 300 C-Arm	S2	1-7
Lifepak 10 Defibrillator/Monitor, NSN 6515-01-453-4003	S2	1-7
Narkomed M Anesthesia Apparatus, NSN 6515-01-457-1840	S2	1-7
Pre-deployment Training Offered	S2	1-7
POGS Medical Oxygen Generator, NSN 6530-01-533-4481	S2	1-8
Preventive Maintenance of the Heater for the Water Distribution and Waste Water Management System	S2	1-8
Pump, Infusion, NSNs 6515-01-452-0625 and 6515-01-486-4310	S2	1-9
Replacement Batteries from Other Than Original Equipment Manufacturer (OEM) Sources	S2	1-11
Surgical Light, NSN 6240-01-455-7873, for Field Operation Table, NSN 6530-01-321-5592	S2	1-11
Test, Measurement, and Diagnostics (TMDE) Program Manager Address	S2	1-12
Tool Kit, Medical Equipment Maintenance and Repair: Repairman's, NSN 5180-00-611-7923, LIN W45334	S2	1-13
ValleyLab Electrosurgical Apparatus, NSN 6515-01-309-6647	S2	1-13
Ventilator, NSN 6530-01-464-0267	S2	1-14
Zoll Defibrillator, Monitor Recorder, NSN 6516-01-515-4197	S2	1-15

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:


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Administrative Assistant to the
Secretary of the Army

Distribution:

To be distributed in accordance with initial distribution number (IDN) 340016, requirements for the SB 8-75 Series.

